NATURAL
RESOURCE
TECHNOLOGY

Ms. Mary Logan
Remedial Project Manager
USEPA, Region 5
77 W. Jackson Boulevard
Chicago, Illinois 60604-3590

April 10, 2008
(1530)

RE: Remedial Investigation/Feasibility Study (RI/FS) Work Plan – Revision 1
Wisconsin Public Service Corporation's Former Manitowoc Manufactured Gas Plant (MGP) Site
CERCLA Docket No.: V-W-06-C-847

Dear Ms. Logan:

This letter contains responses to United States Environmental Protection Agency's (USEPA) written comments received February 11, 2008 regarding RI/FS Work Plan Revision 0 dated June 5, 2007 for the Manitowoc Former MGP. For ease of review, USEPA comments are summarized followed by our response to comment. The substance of these comment responses have been incorporated in RI/FS Work Plan Revision 1 enclosed herewith (clean copy, as requested). Revisions necessary to address USEPA comments on the Completion Report, received June 4, 2007 with responses dated July 25, 2007, have also been incorporated in Revision 1. Further, more details are provided in Revision 1 than were contained in Revision 0 related to evaluation of potential soil vapor intrusion (Section 6.5).

General Comments

1. *Integration with Multi-Site Field Sampling Plan (FSP) Comments: In a letter dated December 20, 2007, EPA submitted comments on the FSP. This site-specific work plan refers to the FSP. Any applicable comments on the FSP apply to this work plan, as well.*

The comment is acknowledged. The SSWP references the Multi-Site FSP Revision 3 submitted on February 20, 2008.

2. *Use of Screening Tools (e.g., TarGOST): The work plan proposes that TarGOST may be used as a screening tool for the sediment characterization. Has any consideration been given to using this approach for some of the upland soils? For example, could this be used to evaluate residuals below the stabilized soils or in the vicinity of MW-12, MW-13 or MW-14? Alternatively, are there any screening tools for BTEX that might be useful?*

The use of screening tools has been evaluated (i.e., TarGOST, Darts) for the sediment and upland soils at the Manitowoc site, and it has been concluded that these screening tools will not be used. For the upland soils, collection of soil samples instead of indirect screening methods is preferred, because tar source areas are generally believed to have been previously excavated or addressed through insitu soil stabilization (ISS) measures. Investigating potential remaining source areas beneath areas of ISS, for example, first requires drilling through the stabilized monolith with a conventional drill rig, and it will be more efficient to collect a soil sample beneath the monolith with this same rig than to mobilize a second rig to use indirect screening tools. For the sediment, TarGOST will not be used because the source areas are generally defined based on previously collected data and additional sediment cores will be collected for direct assessment of the presence/absence of tar. Accordingly, discussion of TarGOST and Darts has been removed from Section 6.7.5.1 of the SSWP.

3. *Potential Site-Specific Considerations for the Conceptual Site Model and RI/FS Planning: the following site-specific considerations should be evaluated to better understand the site-specific CSM. Additionally, as appropriate, RI sampling may be needed to address these concerns, and the FS may need to consider the concerns in the development of remedies.*

    a. *Groundwater/Surface Water Interactions: There are some reasons to believe that there may be groundwater/surface water interactions that may affect sediment quality. The Completion Report identified a number of upland sample locations below the water table with visually stained soils, LNAPL or DNAPL. It is not clear whether these potential sources may be moving towards the surface water. Additionally, historical sediment sample showed extremely high levels of BTEX in some samples near the shore. It is imperative to understand whether there may be contaminated groundwater and/or NAPL that is discharging to surface water and affecting either the sediment or the water quality, or both. Without this understanding, attempts at remediation may be less successful.*

As revised in Section 6.6.2, the proposed piezometer installations in the sand unit below the ISS material along the river (one to three piezometers at locations SB100, SB101 and SB102), and shallow well MW22 located on Wisconsin Central Railroad property, are intended to monitor the quality of the groundwater discharging to sediment and surface water. In addition, Section 6.7.5.2 includes discussion of evaluating potential residual upwelling (see response to Part 3c).

    b. *Turning Basin Boat Traffic: An effort should be made to determine the impact that turning basin boat traffic may have on the fate and transport of contaminants and sediments in the site vicinity. While the work plan proposes to evaluate general flow velocity into and out of the turning basin, there are no proposals to evaluate localized velocity, prop wash, or other boat traffic influences that may be important to sediment stability and/or water quality. It is important to consider this in the RI and the results may influence remedy assumptions in the FS.*

Section 6.7.4 has been revised to include discussion of a qualitative assessment of water quality within the turning basin to provide information regarding the influences boat traffic on sediment stability and water quality. Also, Section 6.7.4 and Table 4 have been revised to include field-measured turbidity and total suspended solids in the lab during the surface water sampling activities.

    c. *Residual Upwelling: During previous work, upwelling of coal tar residuals has been observed in the river. Please plan to evaluate this during the RI. If the upwelling occurs only in areas where (presumptively) sediment will be removed, it may be less important to understand the mechanisms at work. However, if this is occurring in areas where other remedial alternatives may be considered (e.g., capping or MNR), it may be more important to understand the mechanisms (possibly gas ebullition?), to better understand potential risks, and design and evaluate alternatives.*

Section 6.7.5.2 has been revised to include observation and documentation of locations where sheen has been observed on the surface water. In addition, sediment cores will be collected and examined for potential coal tar and gas bubbles. As discussed with USEPA, gas ebullition is the likely cause.

4. *Surface Water Sampling: The work plan proposes an approach to broadly understand potential surface water impacts from the site. While this is important, we may also need to consider a second phase that is more focused on localized impacts above and/or immediately downgradient of the contaminated sediments. This information may be important in evaluating remedial alternatives (e.g., existing conditions vs. potential dredging resuspension). Please provide flexibility in the work plan for the Step I sediment sample results to be used to refine or expand the surface water sampling. In addition, the surface water sampling should be conducted during warmer weather, as more volatiles and semi-volatiles would be released in warmer water temperatures. If possible, the appropriate surface water sampling time should coincide with one of the groundwater sampling rounds in 2008 when river water temperature would be conducive to cause a release to surface water*

Section 6.7.4 has been revised to clarify the data quality objectives (DQOs) and provide flexibility for a second surface water sampling event based on the results of the initial surface water sampling event, groundwater sampling, and/or warm weather conditions.

5. *Navigation Dredging: Since it is likely that remediation dredging will be evaluated as an alternative at the site, the RI and FS should consider the dredging in the navigation channel done by the US Army Corps of Engineers. The RI should summarize historic channel dredging, and to the extent possible, discuss the influence of this dredging on the fate and transport of site contaminants. The FS should consider future potential navigation dredging and the possible effects on site remedies.*

Section 3.6.6 has been included to summarize historic channel dredging events and includes discussion of contaminant fate and transport and considerations for future remedial options with respect to maintaining operational channel depths.

6. *Wisconsin Central Railroad Property: The site-specific Completion Report summarizes available data from the Wisconsin Central Railroad property. Based on the existing work, section 7.2 of the Completion Report recommends additional surface and subsurface characterization of the Wisconsin Central Railroad property. Further, figure 2 of this draft work plan indicates that the site boundary needs to be determined to the west. However, soil sampling on the Wisconsin Central Railroad property has not been proposed in this draft as a data need or as sample locations. Please address.*

New Section 6.4.2.3 has been added to include collection of soil samples during installation of well MW22. Also, Section 3.6.1.2 provides a brief summary of the past sampling results on the property performed by WPSC (predecessor company Wisconsin Fuel &Light) and other sampling that was performed by Wisconsin Central associated with leaking aboveground and underground storage tank sites. The tank site information was obtained from the WDNR web site of Geographic Information System (GIS) registry for closed sites, and Bureau of Remediation and Redevelopment Tracking System (BRRTS) sites; this information is provided in Appendix B3.

7. *Subsurface Sampling: The work plan proposes that subsurface sampling generally extends to 20 feet below ground surface. It would be useful to check depths and contaminant locations of previous subsurface samples, and base the new proposed depths on that historic information to try to bound the vertical extent of contamination. The approach to subsurface sampling should, of course, be linked to the work on characterizing potential continuing sources.*

The intent is to bound the vertical extent of contamination as described in Section 6.4.3, which states "Also, soil samples will be collected to define the vertical extent of contamination from both above and below contaminated layers, as needed, from each boring." Section 6.4.2.2 (Winter Property) has been revised to be consistent with Section 6.4.1 (On-Property Locations) to include "Soil borings will be advanced approximately 20 feet bgs, or until a minimum of 4 consecutive feet of soil that exhibits no MGP impacts (by visual observation and field PID screening) is encountered, unless refusal occurs at a shallower depth." Also, these sections have been revised to include the use of historic sampling information as a basis for proposed boring depths.

8. *Groundwater Monitoring for VOCs: EPA is aware that the site-specific groundwater monitoring program evolved over time under WDNR oversight, to represent site-related contaminants. However, it appears that there may be upgradient or "background" VOCs in the vicinity. Please evaluate whether it would be useful to conduct a full VOC scan for some rounds, because the presence of other contaminants (even if not site related) may affect the cost and effectiveness of certain groundwater remedies.*

A full VOC scan is being conducted on the treatment system influent sample collected semi-annually which, along with prior full VOC scans on the individual monitoring wells (sampling event in May 2005), provides sufficient information to evaluate the cost and effectiveness of groundwater remedies. A summary of analytical data from the treatment system sampling through August 2006, and the May 18, 2005 groundwater laboratory analytical report, are included in Appendix G.

9. *Field Documentation: Generally, EPA cannot mandate the format in which information is documented or submitted. However, it has been our experience that it is generally easier for our state agency counterparts to review information if it is provided on forms or in formats that are familiar. To the extent possible, please follow WDNR formats to document RI work and/or results. This might include:*

    a. *The WDNR Well Information Form http://dnr.wi.gov/org/water/dwg/gw/forms/4400_89.pdf*

    b. *There also may be RI field and documentation activities associated with Chs. NR 700, NR 105, NR 140, and NR 141.*

We acknowledge these forms are available. It is desired to maintain consistency in the Integrys Unitary Program and, as such, the field forms included in the Multi-Site FSP will be used. These forms address the elements of the referenced WDNR forms.

II. Specific Comments

10. *Section 2.4, Previous Response Actions, Excavation and Disposal, Page 7: Were the excavations done in 2004 or in 1994?*

The excavations were done in 1994. Section 2.4 has been revised accordingly.

11. *Section 3.1, Site Topography and Drainage, Page 8: Inclusion of a topographic map at the scale of figure 3 or Figure 4 would facilitate an understanding of this section.*

Site topography information has been added to Figure 4 and Section 3.1 has been revised accordingly.

12. *Page 13, first paragraph: While the area to the north and east may be zoned business, there are residential properties directly adjacent to the site. For example, the first parcel north of the WPS parking lot is 422 s. 10th Street, is a residence. Please discuss this in the land use observations*

Section 3.4 has been revised to include this discussion.

13. *Section 3.6.2.1, Groundwater Monitoring, page 17: Please provide a table with well depths and screen lengths for the existing wells.*

Section 3.6.2.1 has been revised to include a table of existing well information, including well depths, screen lengths, and date of installation.

14. *Section 3.6.2.1 and 3.6.2.2, Page 18 and Figure 11: The text mentions the drawdown effects of extraction well PW-1 and Figure 11 shows a cone of depression at the extraction well. It appears that the cone of depression is based entirely on the water level measured at the extraction well. Water levels at extraction wells should not be used directly due to well inefficiencies and losses. The water level measured in an extraction wells may be much lower than water levels in the aquifer material just outside of the well bore. There appear to be no water level measurement points outside the extraction well and near the extraction well. Using water levels at extraction wells can bias the interpretation of capture; the capture zone suggested by Figure 11 may be interpreted to be much larger than it actually is and the assumed groundwater gradient control may not be being achieved. A piezometer should be installed adjacent to the extraction well to confirm the achievement of hydraulic control.*

We acknowledge that the water level at the extraction well should not be used to interpret the capture zone of the extraction well. An existing piezometer (MW12D) is present adjacent to the extraction well which is screened at the same interval (20 to 35 ft bgs) as the extraction well. The water level at MW12D will be used for future capture zone interpretation in lieu of the water level at the extraction well. The groundwater quality and elevation at proposed water table well MW22 (downgradient from the extraction well and off-property) will assist with determining the adequacy of the capture zone of the extraction well. If groundwater extraction is determined to be part of the final remedy for the site, we acknowledge that additional monitoring wells may be needed to more precisely determine the capture zone of the extraction well and confirm achievement of hydraulic control.

15. *Page 19, last paragraph: The reference to a 2003 surface water sample with a detection of possible creosote oil components was collected by a WDNR Marine Warden and resulted in the issuance of a Wis. Stats 292.11, "Responsible Party" letter requiring WPS to investigate the degree and extent of the contamination and at a minimum, conduct an Interim Action according the requirements of NR 708.11 Wis. Adm. Code. The erection of the signage was a result of the coal tar release to the environment and not in response to the DHFS report.*

The comment is acknowledged. Section 3.6.3 has been revised accordingly.

16. *Page 20, bullet: Please add a bullet specifying that other contaminants were found as well (e.g., sediment sample SB-22 (collected at 0-2 feet) contained benzene at 32,000 mg/kg, benzo(a)pyrene at 330 mg/kg, and total BTEX at 112,000 mg/kg).*

Section 3.6.4 has been revised accordingly.

17. *Page 25 Groundwater COPCs: Given that new areas and new depths are being investigated as part of the RI, please add cyanide (OIA-1677) to the COPC lists for one round minimum to confirm prior findings and assess the new areas.*

Section 3.7 has been revised to add cyanide (OIA-1677) to the groundwater COPC list for one round minimum.

18. *Page 29, Section 4.2.4: Please remove the final sentence. Section 3.7 does not discuss risk management tools, it discusses COPCs. Further, decisions about risk management should be deferred until later in the process.*

Section 4.2.4 has been revised to remove this sentence.

19. *Page 30, second paragraph and page 33, Section 4.3.4: Please leave flexibility in the work plan to consider the inclusion of a residential land use scenario as part of the site-specific CSM and/or risk assessment after the data is obtained. Parts of the contaminated property are municipally owned with no restricted access. The property is bordered by residential property to the north.*

Sections 4.3 and 4.3.4 and Figure 12 have been revised to include the possibility of a residential land use scenario as part of the site-specific CSM and future risk assessment.

20. *Page 32 second paragraph: The future land use scenario of recreational use should probably include more than the Winter Property. The potential future exposure scenarios for any property not under ownership of WPSC, particularly along the waterfront should be further considered in the RI report*

Section 4.3.3 has been revised to include the possibility of future recreational land use for properties not under ownership of WPSC, including City property and Wisconsin Central Railroad property along the waterfront.

21. *Page 34, birds (upland and Aquatic): The "qualitative habitat assessment" (appendix E) conducted*

in January should be confirmed at a time of year when the full quality of the habitat on and off-site can be observed and evaluated to confirm or expand the findings. This can be done concurrently with the RI work.

Sections 4.1 and 4.4 have been revised to include discussion of confirming the habitat assessment for ecological receptors during a time of year when the full quality of the habitat on and off-site can be observed.

22. *Page 37, section 5.1, Task 1: please ensure that this list includes the most recent versions of the multi-site documents.*

The comment is acknowledged. Section 5.1 has been revised to include the most recent versions of the multi-site documents.

23. *Section 6.3.3, Sampling Methods and Abandonment, Page 44: Are the "hydraulic-push" sampling techniques mentioned here equivalent to the "direct-push technology" mentioned in the Multi-Site FSP? It is stated that samples will be "selected as described in Section 4 of the Multi-Site FSP; this reference is not obvious; provide a more specific reference to the Multi-Site FSP or include the rationale for selecting samples in the Site Specific Work Plan.*

The hydraulic-push sampling techniques are equivalent to direct-push technology. For consistency, Section 6.3.3 has been revised to include the use of the term "direct-push" in lieu of "hydraulic-push." The sentence "Samples will be selected as described in Section 4 of the Multi-Site FSP" is not necessary and will be deleted. Rationale for selecting samples is included in the next sentence: "One discrete sample of surface soil (0 to 2 feet depth interval) will be collected from each location for analysis of the parameters and associated methods listed on Table 4."

24. *Section 6.4.2.1, City Property, Page 45: It is stated that soil borings will be performed to assess "...the potential for remaining source in the sand unit below the ISS material." How is this potential being evaluated, if no soil samples are being collected? If only groundwater samples are being collected, then at most the potential for dissolution and leaching from any source material is being evaluated. Is the purpose of these soil borings to evaluate the potential of dissolution and leaching from any source material present into the groundwater, or is it to evaluate the potential presence of source material? Also, see general comment 2 above on the use of screening tools.*

The purpose of the soil borings is to evaluate the potential presence of remaining source material, which would include observation for coal tar product (DNAPL) or residuals in soils during logging of the soil boring. In addition to observation and the collection of the proposed groundwater grab sample, Section 6.4.2.1 has been revised to include possible collection of soil samples if field observation and/or screening indicate the presence of MGP impacts at any of these borings. Soil samples would be collected for additional confirmation of remaining source.

25. *Section 6.4.3, Sampling Methods and Abandonment, Page 46: Are the "hydraulic-push" sampling techniques mentioned here equivalent to the "direct-push technology" mentioned in the Multi-Site FSP?*

As noted in the response to Comment 23, the hydraulic-push sampling techniques are equivalent to direct-push technology. Section 6.4.3 has been revised to include the use of the term "direct-push" in lieu of "hydraulic-push."

26. *Page 47, Section 6.5: The nearby groundwater results should also be considered in evaluating the potential for soil vapor intrusion.*

Section 6.5 has been revised to include the consideration of the nearby groundwater results in evaluating the potential for vapor intrusion.

27. *Section 6.6.1, Existing Well Evaluation, Page 47: How old are the existing wells? Clarify that depending on the results of the evaluation, wells may be redeveloped, rehabilitated, or replaced (consistent with SAS-08-05 of the Multi-Site FSP).*

As noted in the response to Comment 13, Section 3.6.2.1 has been revised to include an existing well information table which includes well depth, screen length, and date of well installation. Also, Section 6.6.1 has been revised to include discussion that depending on the results of the existing well evaluation, the wells may be redeveloped, rehabilitated, or replaced.

28. *Section 6.6.2. Monitoring Well/Piezometer Installation: It is stated on page 48, that drilling and well construction methods will be completed in accord with the methods in Section 4 of Multi-Site FSP. But the Multi-Site FSP is written generally and refers back to the Site Specific Work Plan. The Well Installation SOP in the Multi-site FSP mentions "commonly used well construction materials", "In general ...", and "typically ...". Somewhere specific details of well construction for this site should be provided. The wells will be constructed of what, of what diameters, with what screen slot size, with what size and amount of filter pack? Because the Multi-Site FSP is written somewhat generally, specific details need to be included in this site specific document for all the proposed piezometers and water table wells.*

Section 6.6.2 has been revised to include specific details on the proposed well construction.

29. *Section 6.6.2.1, Bedrock, Page 49: If the piezometers are to be drilled using sonic rotary methods, then why would "wireline rotary drilling methods" be used to obtain bedrock cores?*

Wireline rotary drilling methods will allow collection of competent bedrock cores for field inspection and logging of the rock quality designation (RQD). The sonic method uses vibration to advance the drill stem, which breaks up the cores. Once the competent bedrock cores are collected, the hole will be overdrilled using sonic drilling to provide a large enough diameter for installation of the piezometer. Section 6.6.2.1 has been revised to include this clarification.

30. *Section 6.6.2.2, City Property, Page 49: Clarify the rationale for deciding the number of permanent piezometers to be installed. Exactly what field observations and/or mobile laboratory data would support installing the second and third piezometers?*

Section 6.6.2.2 has been revised to clarify the rationale.

31. *Section 6.6.4, Water Level Measurements, Page 50: It is stated that water level measurements will be completed in accord with the methods in Section 4 of Multi-Site FSP. But the Multi-Site FSP is written generally and the applicable SOP includes two methods (electronic water level indicator and chalked steel tape) and refers back to the Site Specific Work Plan. The Multi-Site FSP states that water levels in wells containing tar will be measured with a weighted standard measuring tape (presumably chalked). What is the measuring method for other wells?*

Water levels in wells without product will be measured with an electronic water level indicator as indicated in Multi-Site FSP, Appendix A, SOP No. SAS-08-01. The well(s) with DNAPL product (i.e., MW14) will first use an electronic water level indicator for water level measurement followed by a clear, bottom-filling bailer to measure product thickness (SOP No. SAS-08-01). Section 6.6.4 has been revised to include this information.

32. *Section 6.6.5, Sampling Schedule and Parameters: The work plan is proposing 1 year of quarterly sampling followed by annual sampling. While this is acceptable for planning purposes, if monitored natural attenuation ends up being considered as a remedial option for groundwater, more than one year of quarterly data likely will be needed to demonstrate a clear trend of decreasing contaminant concentrations.*

The comment is acknowledged. Sections 6.6.5 and 6.6.8 have been revised to include this discussion.

33. *Page 52, section 6.6.7: If it is determined that a well requires abandonment, please confer with the agencies regarding the abandonment and the need to construct a replacement well in that location.*

Section 6.6.7 has been revised to include this step in the process for well abandonment.

34. *Page 56: section 6.7.4: Please clarify the DQOs for the surface water samples. At this time, only one surface water sample will be taken above the known impacted area. If the intent of the surface water sampling is to determine if the impacted sediments are contaminating surface water, then a much higher percentage of samples should be collected above the impacted areas. In addition, the surface water sampling should be conducted during seasonal conditions conducive to releases (e.g., warmer water temperatures).*

As discussed in the response to Comment 4, Section 6.7.4 has been revised to clarify the data quality objectives (DQOs) and provide flexibility for a second surface water sampling event based on the results of the initial surface water sampling event, groundwater sampling, and/or warm weather conditions.

35. *Page 57, first paragraph, section 6.7.4: Please discuss the basis for the proposed velocity measurements at "0.6 times the total water column depth." Is there any reason to believe that the water velocities may differ at different depth strata so significantly that the data would affect the interpretation of the results?*

Section 6.7.4 has been expanded to evaluate water velocity at up to two intervals within the water column depending on water depth, consistent with SOP SAS-09-02 in the latest version of the Multi-Site FSP.

The minimum and maximum velocity at each depth and each location will be recorded on field logs to evaluate the differences in water velocities with depth and for use in the FS.

36. *Page 59, section 6.7.5.1: Please evaluate whether the proposed distribution of sample quantities and PAH range is best. For example, are 5 samples above 1000 ppm likely to be needed? Should there be some samples below 10 ppm that may not be reference locations? Also, will the samples be screened for BTEX to ensure that the toxicity is related to PAHs, and if so, how might we account for BTEX toxicity in the SLERA?*

Initial PAH sample results may be used with an average TOC concentration (from previous analytical results) to evaluate whether the PAH concentrations summarized above provide an appropriate range of predicated toxicity using the USEPA's equilibrium partitioning sediment benchmark (ESB) approach. The distribution may be adjusted based on site-specific conditions.

BTEX and other COPCs will be analyzed to assess confounding effects. COPC concentrations will be compared to the screening levels presented in the Multi-Site RAF. If necessary, the samples selected for toxicity testing may be adjusted to include elevated BTEX concentrations.

37. *Page 60, third full paragraph, section 6.7.5.1: Please provide more detail about how and when a determination to conduct a benthic community structure assessment will be made. If done, it should be conducted at an appropriate season. Finally, how will the potential effects of boat turning and/or navigation dredging be distinguished from contaminants?*

The discussion on the benthic community structure assessment was moved from Section 6.7.5.1 to 6.7.5.2. Section 6.7.5.2 has been expanded to include decision criteria for performing the benthic community structure assessment. The approach and locations will be reviewed with USEPA prior to performing the assessment in an effort to distinguish the potentially confounding effects of boat traffic and/or dredging versus COPC concentrations in sediment.

38. *Page 62: The section on sediment source area delineation calls for a screening assessment to characterize the presence or absence of tar and the total PAHs. The section is fairly vague about what will be done – it states that TarGOST may be used, or other methods such as poling or coring. Prior to the work, additional detail about how this delineation will be conducted should be provided to the Agencies.*

The potential use of TarGOST to evaluate source areas in sediment has been removed. Source areas will be delineated as part of Step II sediment sampling using previously collected data and results of Step I to focus the initial sediment sampling locations as described in Section 6.7.5.2.

39. *Page 64, Section 6.7.5.2, first paragraph: Prior to the work, additional detail about the specific method to obtain sediment cores should be provided to the Agencies.*

The specific drilling methods will be identified to USEPA prior to contracting as described in Section 6.7.5.2, the second paragraph. The drilling method selected will consider core recovery, core disturbance, contractor availability, and contractor costs.

40. *Page 65, first paragraph: Please rephrase the statement "... the core location will not be considered in the FS." All cores that are analyzed must be reported in the RI and should be "considered" (acknowledged) in the FS. Perhaps a better phrasing would be "Data from the cores and the site-specific risk values will be used in the FS to establish areas for which remedial alternatives will be developed."*

The text has been revised as suggested.

41. *Page 65 – 66, Sampling Transects: This section acknowledges that the location of transects may be adjusted based on findings in Step I. Please plan to discuss this with the Agencies after Step I information is available. Additionally, there are some inconsistencies between the introductory paragraph and the bullets (e.g., is TS2-1 500 or 600 feet upstream; is TS2-9 500 or 700 feet downstream?). Finally, we should begin a dialogue about how data will be extrapolated between data points because this may influence decisions about more samples in certain areas, spacing of transects, or other characterization approaches.*

The initial sediment transects/locations will be reviewed with USEPA prior to initiating Step II sampling. Section 6.7.5.2, the first paragraph under "Sampling Transects" has been modified to include discussions with USEPA prior to initiating Step II sampling. Initial sediment transects and locations may be adjusted based on the findings of Step I.

42. *Page, 70 investigative derived waste: prior to collecting samples for disposal purposed WPS/NRT should contact the receiving landfill and obtain the list of required samples and analyses protocol.*

Section 6.8 has been clarified to include contact with the landfill to verify the required analysis prior to sending waste characterization samples to the laboratory.

43. *Table 4: Please consider adding the following parameters to be analyzed:*

    a. *Surface water – TSS and or turbidity should be listed in note 8 as a field parameter.*

    b. *Sediment – It might be useful in developing remedies to include some measures of bearing strength, in-situ porosity, or bulk density.*

43.a. Surface water samples will be analyzed for total suspended solids (TSS) in the analytical laboratory and turbidity will be measured in the field during surface water sampling activities.

43.b. Field measurement of fine-grained sediment shear strength was added to Table 4. Bulk density and porosity can/will be back-calculated using specific gravity and moisture content test results, and the assumption that the sediments are saturated.

Please do not hesitate to contact Mr. Brian Bartoszek (Integrys Business Support, LLC) at 920-433-2643 if you have any questions regarding this letter or the enclosed Work Plan Revision 1. Per our earlier discussion, we are available to have a conference call regarding the revisions made to these documents in order to expedite finalization of these documents.

We look forward to your review and approval.

Sincerely,

NATURAL RESOURCE TECHNOLOGY, INC.

Julie A. Zimdars

Julie A. Zimdars, PE	Richard H. Weber, PE
Senior Engineer	Managing Engineer

Encl.: RI/FS Work Plan, Revision 1 (3 hard copies, plus 2 CD's)

cc: Mr. Brian Bartoszek, IBS (w/ 1 CD)
Ms. Annette Weissbach, WDNR (w/ 1 hard copy)
Mr. Mark Thimke, Foley & Lardner (letter only)

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Natural Resource Technology

Remedial Investigation / Feasibility Study Site Specific Work Plan

Manitowoc Former Manufactured Gas Plant Site
Manitowoc, Wisconsin
WIN 000509949

Revision 1
April 10, 2008

Project No: 1530

NATURAL
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REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SITE-SPECIFIC WORK PLAN

FORMER MANITOWOC MANUFACTURED GAS PLANT SITE
MANITOWOC, WISCONSIN
WIN000509949

Project No: 1530

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Revision 1
April 10, 2008

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FIGURES

TABLES

APPENDICES

SHEETS

ACRONYMS

AOC	Administrative Order On Consent
ARARs	Applicable or Relevant and Appropriate Requirements
bgs	Below Ground Surface
BERA	Baseline Ecological Risk Assessment
BIRA	Baseline Risk Assessment
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
BTX	Benzene, Toluene, and Xylene
CBSQG	Consensus Based Sediment Quality Guidelines
CERCLA ("Superfund")	Comprehensive Environmental Response, Compensation, and Liability Act
Commerce	Wisconsin Department of Commerce
COPCs	Contaminants of Potential Concern
CSM	Generalized Conceptual Site Model
DGPS	Differential Global Position System
DHFS	Wisconsin Department of Health and Family Services
DLs	Detection Limits
DNAPL	Dense Non-Aqueous Phase Liquid
DQOs	Data Quality Objectives
EDI	EDI Engineering & Science, Inc
EDR	Environmental Data Research Inc.
ERAGS	Ecological Risk Assessment Guidance For Superfund
ERP	Environmental Response Program
ES	NR 140 Enforcement Standard
FEMA	Federal Emergency Management Administration
FSP	Multi Site Field Sampling Plan
GIS	Geographic Information System
GLNPO	Great Lakes National Program Office
HASP	Multi Site Health and Safety Plan
IC	Institutional Control
ISS	In-Situ Solidification/Stabilization
LAST	Leaking Aboveground Storage Tank
LIF	Laser-Induced Fluorescence
LNAPL	Light Non-Aqueous Phase Liquid
LUST	Leaking Underground Storage Tank
mg/kg	Milligrams Per Kilogram
MGP	Manufactured Gas Plant
MNA	Monitored Natural Attenuation
MSL	Mean Sea Level
NAPL	Non-Aqueous Phase Liquid
NCP	National Contingency Plan
NRT	Natural Resource Technology, Inc

OSR	Off-site Rule
O&M	Operation and Maintenance
OM&M	Operation, Maintenance and Monitoring
PAHs	Polynuclear Aromatic Hydrocarbons
PAL	NR 140 Preventive Action Limit
PCBs	Polychlorinated Biphenyls
POTW	Publicly Owned Treatment Works
PQLs	Project Quantitation Limits
PVOCs	Petroleum Volatile Organic Compounds
QA/QC	Quality Assurance/Quality Control
QAPP	Multi Site Quality Assurance Project Plan
RAF	Multi Site Risk Assessment Framework
RAO	Remedial Action Objective
RI	Remedial Investigation
RI/FS	Remedial Investigation and Feasibility Study
RLs	Reporting Limits
ROD	Record of Decision
RQD	Rock Quality Designation
SARA	Superfund Amendments and Reauthorization Act
SIM	Selected Ion Monitoring
SLERA	Screening Level Ecological Risk Assessment
SSLs	Soil Screening Levels
SOP	Standard Operating Procedure
SOW	Statement of Work
SSWP	Site Specific Work Plan
SVOC	Semi Volatile Organic Compounds
TBC	To Be Considered
TEC	Threshold Effect Concentration
TOC	Total Organic Carbon
UCL	Upper Confidence Limit
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	US Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank
UTM	Universal Transverse Mercator
VOCs	Volatile Organic Compounds
WAC	Wisconsin Administrative Code
WAD	Weak Acid Dissociable Cyanide
WDNR	Wisconsin Department of Natural Resources
WF&L	Wisconsin Fuel & Light Co.
WPSC	Wisconsin Public Service Corporation
WWES	WW Engineering & Science

1 INTRODUCTION

1.1 Purpose

This Site-Specific Work Plan (SSWP) describes the procedures to be followed and tasks necessary to complete the Remedial Investigation and Feasibility Study (RI/FS) at the former Manitowoc Manufactured Gas Plant (MGP) facility (Figure 1), in accordance with the Administrative Order on Consent (AOC) and Statement of Work (SOW), CERCLA Docket No. V-W-06-C-847, dated May 5, 2006. The AOC and SOW addresses six of Wisconsin Public Service Corporation's (WPSC) former MGPs. Under the AOC/SOW, a generic approach to addressing the six sites is to be developed (the Multi-Site approach), which, in turn, may be modified to account for site-specific differences that may exist at a particular location.

As discussed in this SSWP and the Manitowoc Completion Report (December 2006, Natural Resource Technology, Inc. [NRT]), substantial RI and response actions were previously performed prior to WPSC's transferring the Site from the Wisconsin Department of Natural Resources (WDNR) to the United States Environmental Protection Agency (USEPA). This SSWP builds upon previous data and information, as well as reports prepared by WPSC. This SSWP was prepared in accordance with applicable federal regulations, including Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or "Superfund") as amended by Superfund Amendments and Reauthorization Act (SARA) and the National Contingency Plan (NCP).

The SSWP includes elements of the FS, as defined in the SOW that will be fully developed pending approval of the Multi-Site FS support documents. Although the Multi-Site support documents are not yet approved, and USEPA has not yet finished review of the Completion Report, WPSC developed this SSWP to maintain progress with respect to the former Manitowoc MGP facility. If necessary, modifications will be provided in revisions or separate documents, as appropriate.

1.2 Objectives

This SSWP identifies the procedures to be used for evaluating the nature and extent of MGP residuals in soil, groundwater, sediment, and surface water for use in human health and ecological risk assessments and feasibility studies. The risk assessments will determine if the Site presents a risk to human health and/or the environment. The SSWP also sets forth the process to be used to develop and evaluate remedial alternatives.

1.3 Scope

The SSWP is organized as follows:

Section 2	Site Background and Setting
Section 3	Summary of Site Characteristics
Section 4	Site-Specific Conceptual Site Model Summary
Section 5	Project Scoping and Planning Activities
Section 6	Site Characterization and Assessment Activities
Section 7	Remedial Investigation Report
Section 8	Feasibility Study Scope of Work
Section 9	Schedule
Section 10	References

2 SITE BACKGROUND AND SETTING

For the purposes of this document, the following definitions will be used herein:

- Facility – Refers to the former WPSC MGP structures and related areas (Figures 3 and 4);
- On-property – Refers to the specific parcel currently owned by WPSC located at 402 North Tenth Street, Manitowoc (Figures 2 and 3); and
- Site – Refers to areas where contamination related to the former MGP has been discovered through site investigation activities completed to-date and near-by areas necessary for implementation of the response action. These areas include the facility and on-property as well as portions of City Property, Chicago Street and North Eleventh Street right-of-ways, privately owned and WPSC-owned land south of Chicago Street and privately owned land west of North Eleventh Street, and an adjacent portion of the Manitowoc River containing contaminated sediments related to the former MGP. The approximate extent of the upland portion of the Site is shown on Figures 2 and 3.

2.1 Site Description and Current Conditions

The former Manitowoc MGP facility is located at 402 North Tenth Street, Manitowoc, Manitowoc County, Wisconsin (Figure 1). The current WPSC property (referred to as on-property) is bounded on the northwest by City-owned property and the Manitowoc River, on the north by additional WPSC-owned parcels (not included as "on-property"), on the east by North Tenth Street, on the south by Chicago Street, and on the west by North Eleventh Street (Figure 2). The property encompasses approximately 1.1 acres as shown on the property owner and zoning map (Figure 3). A multi-tenant office building occupies much of the property, which was formerly used by Wisconsin Fuel & Light Company (WF&L). Areas north, east and west of the building are covered by asphalt pavement, whereas the south side area is mostly grass. Currently, Manitowoc Food Service leases the top floor of the building for office space. The bottom floor of the building is used mainly for WPSC vehicle storage and also contains the groundwater treatment system equipment. The former MGP structures were located mostly on-property, with the addition of a former gas holder located off-property to the south (Figure 4).

The City owns property between the subject property's north property line and the river (triangular-shape property shown on Figure 3). The property located west of the subject property on the west side of Eleventh

Street (along the river) is owned by Canadian National Railroad (formerly Wisconsin Central Railroad Ltd). To be consistent with past reports, the property will continue to be referred to as the Wisconsin Central Railroad Property. Braun Building Center Inc. is located south of Wisconsin Central Railroad's property. Braun Building appears to use Wisconsin Central Railroad's property to store lumber for their pre-fabricated building operations. The properties located south of the subject property, on the south side of Chicago Street, are owned by Tom Kitzerow Enterprises LLC (parcel on the west), 306 North Tenth Street Building LLC (parcels in middle) and Winter (parcel on the east). WPSC owns a small parcel along the south side of Chicago Street, adjacent to the Winter Property. The building on the Winter Property, where an MGP gas holder was located, is an attorney's office.

The Manitowoc River is approximately 400 feet across adjacent to the former MGP facility and is utilized as a turning basin for large cargo ships. A sheet pile wall exists adjacent to the City Property and steep banks exist on both the north and west ends of the wall. There is no obvious location to easily access the river and only a limited distance out into the river is possible for wading. At a distance of approximately 60 feet from the shoreline, water depths are known to be more than 21 feet, the project depth within the U.S. Army Corps of Engineers (USACE) navigation channel. It is difficult to accurately estimate the size of the Site within the Manitowoc River based on the historic results; therefore, data from the work outlined herein will be used to establish the size of the Site within the river. Property owner information and zoning is shown on Figure 3.

The responsible party, Site location and identification information is summarized below.

Responsible Party:	Wisconsin Public Service Corporation Contact: Mr. Brian Bartoszek (920.433.2643) 700 North Adams Street, P.O. Box 19002 Green Bay, WI 54307 9002
Site Location:	T19N, R24E, Section 19 402 North Tenth Street Manitowoc, Wisconsin Manitowoc County
USEPA ID (WDNR BRRTS #)	WIN000509949 (02-36-000219)

The majority of the upland portion of the Site is covered with pavement and buildings with a slope toward the Manitowoc River. Nineteen monitoring wells and piezometers and one pumping well are located on or near the Site. The monitoring wells are located on property currently owned by WPSC, property owned by others, City Property adjacent to the river, and City right-of-way of streets to the west and south (Figure 2).

2.2 Site History

Sanborn maps obtained for development of historical maps for this SSWP were from 1883 through 1966 and showed the presence of numerous former MGP related structures from the early 1900's to the 1950's (Appendix A1). Also, a 1963 historical plant drawing indicated some former MGP related structures (Appendix A2). These maps were used as source maps to update the historical map for the facility. These structures are shown on Figure 4 and include:

- Retort building with condenser and purifier;
- Water gas plant building;
- Purifying boxes; and
- Two gas holders with capacities of 100,000 cubic feet (on-property) and 300,000 cubic feet (off-property to south in location of present Winter building).

Background research for this Work Plan was supplied by Environmental Data Research Inc. (EDR). The EDR radius map and report are provided in Appendix B1. The report indicates that several aboveground storage tanks were present on the west side of North Eleventh Street on property previously owned by Shell Oil, Sinclair Refining Co., and Standard Oil (approximate locations shown on Figure 5). This property is currently owned by Canadian National/Wisconsin Central. Two leaking underground storage tanks (LUSTs) and one leaking above ground storage tank (LAST) were documented in the EDR report as the Holmes Oil site (Appendix B2); however, Canadian National/Wisconsin Central is listed as the responsible party. The investigation was closed with deed restrictions by the Wisconsin Department of Commerce (Commerce) in September of 2005.

Additional near-by impacted sites documented in the EDR report include a LUST site located south of the property at 308 North Tenth Street, and an Environmental Response Program (ERP) site also south of the property at the corner of North Eleventh and Buffalo Street (Appendix B2). Metz Baking Company was the responsible party for the LUST site which was closed by WDNR in August of 1996. That property is currently owned by 306 North Tenth Street Building LLC. Soo Line and Canadian National Railroads were the responsible parties for the ERP site which had reported polynuclear aromatic hydrocarbon (PAH) and volatile organic compound (VOC) impacts. This site was conditionally closed by WDNR with deed restrictions in July of 2006, and is currently owned by Canadian National/Wisconsin Central.

2.3 Previous Investigation Summary

The Completion Report (December 2006, NRT) contains a full bibliography of the reports and summaries issued for the Site. Site investigation and remediation activities were previously undertaken since the late-1980s through the present. Investigations completed prior to the soil remediation activities in 1993 and 1994 focused on identifying source areas and groundwater assessment. Investigations included soil borings and groundwater sampling from monitoring wells and piezometers. WDNR supervised remediation activities that were performed in 1993 and 1994, as discussed in Section 2.4.

Additional investigation work occurred between 1995 and 1997 for the upland portion of the Site and between 2000 and 2003 for the Manitowoc River. All upland sampling locations are shown on Figure 6 and all sediment poling and sampling locations in the Manitowoc River on shown on Sheet 1. Supplemental Site investigation activities focused on the Manitowoc River, the Wisconsin Central Railroad Property, and the MGP product discovered at groundwater monitoring well MW14 located near the southwest corner of the on-property building. Groundwater remediation and monitoring is on-going and groundwater monitoring reports have been prepared on an annual basis, the last one dated October 31, 2006 (October 2006, NRT). The current conditions of the Site are summarized in Section 3.6.

2.4 Previous Response Actions

A number of response actions were previously performed at the Site (see Completion Report, December 2006, NRT). These previous response actions are illustrated on Figure 7 and include:

- Excavation for Sheet Pile Retaining Wall Reconstruction. As part of implementing in-situ solidification/stabilization (ISS), the anchor system for the existing sheet pile wall was replaced. These activities included removal and segregation of the top 2 feet of overburden soil and removal of 3,051 cubic yards (4,271 tons) of contaminated soil and disposal at Ridgeview Landfill in Whitelaw, Wisconsin in June and July 1993. Drawings of the retaining wall (Sheets S1 and S2, Appendix C) indicate that the wall is constructed of sheets that are approximately 36-feet in length. The top of the wall is at approximately 585 feet and extends down to approximately 549 feet, which is near the till and/or bedrock surface as shown in the cross-sections (Sheets C3 and C4, Appendix C).

- In-situ stabilization and solidification (ISS). Approximately 13,772 cubic yards of soil was treated by ISS in 1993 and 1994 on the north, west and south sides of the on-property building, the majority of the ISS area being located on City-owned land or right-of-way. Soils were treated to reported depths of 32 to 40 feet below ground surface, ending in native sand material. As part of this activity, 4,093 cubic yards of overburden soils were required to be landfilled. This material expanded above ground during the ISS process.

- Surface Soil Removal. The top four feet of soil was excavated on the north side of the on-property building in 1994 (most likely). No documentation of this surface soil excavation was found in the 1995 Interim Closure Report with exception of a report figure showing this 4-foot excavation, and therefore the disposition of the soil is unknown. From this 1995 map, NRT estimates that the surface area of the 4-foot excavation is 17,575 square feet, with an estimated volume of 2,600 cubic yards (3,640 tons).

- Excavation and Disposal. Soils were excavated in January 1994 in the following areas: 1) a small area located west of the storm sewer; and 2) a larger area located west and south of the on-property building and east of the storm sewer. The majority of the soils were excavated in the right-of-way of North Eleventh Street and Chicago Street. Approximately 1,410 cubic yards (1,975 tons) of coal tar impacted soils were removed and disposed at Ridgeview Landfill. The final depth of the excavation was based on the depth to groundwater, ranging from 10 feet to 12 feet below ground surface.

- Backfilling and Surface Restoration. The excavation performed west and south of the on-property building, and presumably the surface soil excavation performed north of the building, were backfilled with clean imported fill. Following this, asphalt or concrete pavement was restored in all areas that were disturbed, including ISS and excavation.

- Groundwater Remediation. A single groundwater extraction well (PW-1) and pre-treatment system (filtration followed by granular activated carbon) were installed in 1997 to address residual product and MGP residuals outside of the stabilized area (e.g., well MW14 area). The well is located in the North Eleventh Street right-of-way. The system discharges to the City of Manitowoc wastewater treatment plant at flow rates ranging from 4 to 18 gallons per minute (gpm).

3 SUMMARY OF CURRENT SITE CHARACTERISTICS

3.1 Site Topography and Drainage

The Site is located along the southern bank of the Manitowoc River and contains topographic features related to the floodplains and bluffs of the river (Figures 3 and 4). River stage is approximately 580 feet above mean sea level (MSL) at the Site. The banks of the river in the vicinity of the Site are steep woody slopes and/or sheet pile walls. Areas within the 100 year floodplain defined by the Federal Emergency Management Agency (FEMA) are located adjacent to the river banks (Figure 3), including:

- A portion of the triangular shaped City parking lot located along the river and a portion of the property located south of the City lot;
- The northern end of North Eleventh Street approximately 60 feet south of the sheet pile wall; and
- The private road west of North Eleventh Street located on Wisconsin Central Railroad Property between the river and the storage buildings on Braun Building Property.

Generally, the floodplain is flat with a mild slope toward the Manitowoc River. Ground surface elevation of the floodplain is approximately 590 feet above sea level.

Slopes from the bluff down to the floodplain are found northeast of the parking lot between the on-property building and the fence on top of the bluff, and from the intersection of North Tenth and Chicago Streets down to the river along Chicago and North Eleventh Streets (Figure 4). On-property, the ground slopes steeply from the top of the bluff down to the northeast corner of the parking lot. Off-property, Chicago Street and North Eleventh Street slopes moderately from the top of the bluff down to the river along the southern and western edges of the property. The on-property building that borders the parking lot on the east and south sides was constructed along the edge of the bluff so the basement floor is at the same elevation as the parking lot (100 year floodplain), and the first floor is at the same elevation as the top of the bluff.

The remainder of the Site, including the eastern portion on-property and within Chicago Street and the Winter Property is located on top of the bluff. The bluff is generally flat with ground surface elevations of approximately 600 feet above sea level.

Surface water from the floodplain areas slopes off the bluff described above and flows over land into the river. Curb-side storm inlets collect runoff from paved surfaces, roads, and grass areas located on top of the bluff. Storm water from the bluff enters the 12-inch storm sewer in Chicago Street which flows west into a 15-inch storm sewer located in North Eleventh Street. From there, the water flows north towards the river and discharges from a storm sewer pipe that passes through the sheet pile wall. There are no wetlands present in the vicinity of the Site as further documented in Appendix E.

3.2 Geology and Hydrogeology

The information provided below is based on previous investigations, and it includes results from soil borings, test pits, groundwater monitoring wells, etc. This summary is an overview for purposes of providing reference information in this SSWP. Details are set forth in the Completion Report (December 2006, NRT) and other previously referenced Site documents.

3.2.1 Regional Setting

Manitowoc is located on the western shore of Lake Michigan and lies within the Wisconsin-Lake Michigan basin. The Wisconsin-Lake Michigan basin is a 3,600 square mile drainage area that lies along eastern Wisconsin and borders the western shore of Lake Michigan (Skinner and Borman, 1973). The near-surface geology of the Manitowoc area is characterized by poorly permeable glacial lake deposits of sand, silt, and clay that range up to 150 feet thick. Stratified sand and gravel alluvial deposits also occur along the Manitowoc River.

Silurian dolomite bedrock underlies the glacial soils around Manitowoc, and is present at depths between 50 and 200 feet below ground surface (bgs). In the Manitowoc area, the Silurian bedrock is the top of a sequence of layered sedimentary rocks dating from the Cambrian to the Silurian which overlie crystalline pre-Cambrian rocks. Regionally, this sequence of sedimentary rocks slopes to the southeast.

The Wisconsin-Lake Michigan basin contains three main aquifers, the unlithified sand and gravel aquifer, the Niagara dolomite aquifer, and the Cambrian sandstone aquifer. The sand and gravel glacial alluvium in the basin is a significant source of water. These deposits may be inter-layered with or covered by less permeable overburden. Thick accumulations of sand and gravel have produced as much as 1,200 gpm in-land; while, collector (Ranney) wells in Manitowoc that induce recharge from Lake Michigan have produced as much as 5,500 gpm (Skinner and Borman, 1973). Generally, groundwater flow in the sand and gravel is toward rivers and streams that eventually discharge into Lake Michigan. Recharge is local from precipitation and surface water bodies.

The Niagara aquifer underlies the sand and gravel aquifer and is the most widely used source of groundwater. Water moves through cracks, crevices, and fractures within the dolomite bedrock. The distribution of those openings is not uniform throughout the formation and therefore well yields from this formation are not predictable. Most wells produce at least 10 gpm and some high capacity wells have produced up to 1,200 gpm (Skinner and Borman, 1973). Many parts of the Niagara aquifer are artesian, due in part to the glacial clay till overburden present in most locations. Generally, groundwater flow in the Niagara is toward Lake Michigan. Recharge to the Niagara is local, and paths of movement are short.

The Cambrian sandstone aquifer underlies the entire Wisconsin-Lake Michigan basin and includes Ordovician and Cambrian units between the Maquoketa shale and Pre-Cambrian rocks. Where present, the Maquoketa shale is a regional aquatard that isolates the Niagara and Cambrian sandstone aquifers. The sandstone aquifer is most extensively used in the southern portions of the basin including the Milwaukee area. Yields from this aquifer vary with the thickness of the sandstone penetrated, with as much as 1,500 gpm being produced in a well near Milwaukee (Skinner and Borman, 1973). Generally, groundwater flow in the sandstone is toward Lake Michigan. Most recharge to the sandstone is by lateral movement of water from west of the basin, although a small amount of water moves down through the Maquoketa shale.

3.2.2 Local Summary

Soil stratigraphy at the former Manitowoc MGP Site consists of three to 10 feet of miscellaneous sand, silt and clay fill material overlying glacial deposits of sand with varying amounts of gravel, silt and clay. The glacial deposits along the western portion of the property generally consist of sand and silt, while the deposits on the eastern portion of the property consist mostly of sand and gravel. Unlithified materials extend to at least 40 feet bgs, and bedrock is estimated to be approximately 50 feet bgs depending on surface elevation.

None of the Site soil borings or wells penetrated into bedrock. The top of bedrock and/or pieces of bedrock have been noted on a few of the boring logs in the Completion Report (December 2006, NRT). Cross-sections of the ISS area (Sheets C3 and C4 of Appendix C) show the bedrock surface is flat and located approximately 40 feet bgs adjacent to the river.

Depth to groundwater measurements across the Site are variable (between five and 22 feet bgs) due to changes in topography discussed above. Groundwater measurements indicate that shallow groundwater horizontal gradients are relatively flat (around 0.003 ft/ft) and flow is generally north towards the Manitowoc River (Figure 11). The Manitowoc River is a gaining stream near Lake Michigan that receives groundwater and surface water from the Manitowoc area and discharges into the lake. Shallow groundwater from the central and western portions of the Site currently are captured within the cone of depression created when groundwater pumping well (PW-1) is active.

Currently there are no nested wells with piezometers for the evaluation of groundwater vertical gradients. Additionally, there are no wells monitoring groundwater in the bedrock to determine local bedrock flow.

3.3 Climate

The climate in the vicinity of Manitowoc is typically continental with some modification by Lake Michigan. The moderating effect of Lake Michigan is well illustrated by the fact that the growing season of 140 to 150 days along the east-central coastal area is of the same duration as in the southwestern Wisconsin valleys. The average date of last spring freeze is early May and the first autumn freezes occur in mid-October along the Lake Michigan coastline. Most of the streams and lakes in the area are ice-covered from late November to late March, and snow covers the ground for much of the same period. Flooding is most frequent and serious during April.[1]

Historic temperature and precipitation data for Manitowoc is summarized in the table below[2]. Average monthly temperatures range from about 18°F in January to about 70°F in July. The high and low monthly averages range by approximately ±10°F from the monthly mean. Almost 60 percent of the total annual rainfall generally occurs between May and October. Over 90 percent of the total annual snowfall occurs between December and March. Overall, the mean average temperature for the area is approximately 45°F and over 30 total inches of precipitation (both rainfall and snow accumulation) is received.

	Monthly Temperature Ranges (°F)			Monthly Averages (in.)	
Month	High	Low	Mean	Precipitation	Snowfall
January	26.5	10.8	18.7	1.83	6.3
February	30.4	15.3	22.9	1.24	5.4
March	39.9	24.4	32.2	1.94	4
April	52.1	34.1	43.1	2.85	0.5
May	64.9	44.3	54.6	2.79	0
June	74.6	53.6	64.1	3.26	0
July	79.6	60.1	69.9	3.44	0
August	77.6	59.3	68.5	3.73	0
September	69.8	51.6	60.7	3.1	0
October	57.4	40.8	49.1	2.25	0
November	43.5	29.2	36.4	2.3	1.5
December	31.3	16.7	24	1.76	4.3
Annual Precipitation Totals				30.49	22

[1] Climactic information from Wisconsin State Climatology Office website, http://www.aos.wisc.edu/%7Esco/state.html

[2] Historic data from the Midwestern Regional Climate Center (MRCC) website, http://mcc.sws.uiuc.edu/climate_midwest/mwclimate_data_summaries.htm#

3.4 Population and Land Use

The population of the City of Manitowoc is approximately 35,000 people, based on the 2005 U.S. census and current projection for 2010. The City of Manitowoc does not track land use outside of property zoning permits. The land around the former MGP facility has been zoned for business, commercial and industrial use (Figure 3). It is important to note that single and multi-family dwellings may be located within the business zones, but not the commercial or industrial zones. According to the Zoning Map for Manitowoc, portions of the Site are located within the business and industrial zones. The on-property former MGP structures and the land to the north and east is Zoned B-3 "Business (General)". It is known that a residence exists on the first parcel north of the WPSC parking lot. The off-property land to the south and west where the 300,000 cubic foot gas holder was located (Winter Property) and the Wisconsin Central Railroad Property are Zoned I-2 "Industrial (Heavy)". This zoning information was obtained through the City of Manitowoc interactive Geographic Information System (GIS) website[3].

The City of Manitowoc receives municipal water from intake pipes located 2-miles off-shore in Lake Michigan. The City also maintains an underground "Ranney Well", known as Collector C located just south of Silver Creek Park. Patented by the Ranney Corporation, these wells utilize horizontal shafts, like the spokes of a wheel, to increase collection capacities. Collector C was constructed and put into service in 1944. The Ranney Well is a standby well located approximately 3 miles south of the Site and by design induces recharge from Lake Michigan to supply the well. Site conditions have not affected the municipal water supply because the City uses Lake Michigan water either directly or indirectly to meet demands.

3.5 Cultural and Natural Resource Features

An inquiry was made by WPSC to the United States Fish and Wildlife Service (USFWS) regarding potential endangered or threatened species or critical habitat present in the vicinity of the Site. USFWS

[3] The City of Manitowoc Zoning Map was accessed using the city GIS website, http://webmap.manitowoc.org/website/PASystem/gisportal.htm

indicated that a threatened fish species (Greater Redhorse) was identified as being located in this section and within the Manitowoc River. During preparations for sediment investigation and remediation, the local fisheries biologist will be contacted for further information. The spawning period for this fish species is between May and June.

A similar review of the state Historic Preservation database indicates the presence of Site MN-0331. This site is described as a campsite/village where a copper knife was found on or near the former MGP. As such, further archaeological survey work may be required to determine if the Site has any integrity. However, the severity of soil disturbance documented at the Site over the last 50 years suggests that the Site does not have any integrity; and therefore, additional survey work will likely not be required. If it is determined that additional archaeological work is required, it must be conducted in unfrozen conditions.

3.6 Previous Investigation Findings & Current Site Status

This section summarizes the current Site status including the extent and magnitude of MGP residuals.

3.6.1 Soil Quality and Potential Source Areas

The Completion Report (December 2006, NRT) identified remaining potential upland areas of concern related to soil quality including:

- On-property areas including the former 100,000 cubic foot gas holder and the source area located at the southwest corner of the building near the former condenser (MW14 area) (Figure 4);
- Wisconsin Central Railroad property located to the west of the former MGP facility; and
- Off-property gas holder located to the south of the former MGP facility on the Winter Property.

Residual benzene and naphthalene concentrations in soil in these three areas are shown on Figures 8 through 10. Other potential source areas that require further investigation have been identified on-property including the former retort building and purifier, the former water gas plant building, and the purifier boxes. These areas will be included with the discussions of the on-property potential source areas below.

3.6.1.1 On-Property Potential Source Areas

The remaining on-property potential source areas include the former MGP structures (Figure 6). These structures have limited soil boring information and require further investigation to assess if response actions are warranted to manage the potential risk to human health and the environment as summarized below:

On-property Gas Holder – One soil boring (SB3) was previously performed on the south side of the current building inside the former gas holder. The boring identified coal tar impacts at the base of the holder at a depth of 16 to 17 feet bgs in this location. Concentrations of benzene and naphthalene in soil at this depth interval were identified to be 32 mg/kg and 730 mg/kg, respectively, as shown on Figure 8. The bottom of the holder was identified at 17 feet bgs.

Retorts – One soil boring (SB15) was previously performed on the north side of the current building on the north end of the retorts area. The boring identified coal tar impacts (approximately 0.3 feet in thickness) just above the suspected retort foundation at 10 feet bgs as shown on Figure 9. The boring ended with refusal at 10 feet bgs and no soil samples were collected.

Condenser – One soil boring (SB58) was previously performed on the south side of the current building in the former condenser location to a depth of 35 feet bgs. A soil sample was collected from 13 to 15 feet bgs which indicated a non-detectable benzene concentration and 3,200 mg/kg of naphthalene as shown on Figure 9. As indicated in past reports documenting the previous ISS and excavation activities, a tank was identified 3 to 6 feet bgs in the former condenser area. An electromagnetic survey indicated a metal anomaly in this same area, likely near boring SB58. As documented, the western half of the tank was encapsulated by ISS. No documentation was found to indicate the tank or tank contents, suspected to be coal tar product, was removed. This tank may be cause of the product found at MW14.

Purifier – One soil boring (SB4) was performed on the south side of the current building in the area of the former purifier to a depth of 21.5 feet bgs. A soil sample was collected from 7.5 to 9 feet bgs which indicated a non-detectable benzene concentration and 0.5 mg/kg of naphthalene as shown on Figures 8 and 9. No evidence of purifier waste was indicated in the boring log.

Water Gas Plant Building – No soil borings have been completed within the footprint of the former water gas plant.

Purifier Boxes – One soil boring (SB2) was performed on the south side of the current building in the area of the former purifier boxes to a depth of 21.5 feet bgs. A soil sample was collected from 20 to 21.5 feet bgs which indicated non-detectable concentrations of benzene and naphthalene as shown on Figure 8. No evidence of purifier waste was indicated in the boring log.

3.6.1.2 Wisconsin Central Railroad Property

No former MGP structures are known to have been present on Wisconsin Central Railroad Property. However, due to suspected off-site migration of coal tar contamination onto this property, several borings and wells were completed in 1995 including wells MW15T and MW16T and borings SB95-1, SB95-2, SB95-3, SB95-4, and SB95-6 (Figure 6). Residual benzene and naphthalene concentrations in soil on this property are shown on Figure 10. Only one soil sample from SB95-3 collected at 3 to 5 feet bgs indicated PAH and carbazole impacts, including 19 mg/kg naphthalene. The boring logs for all SB95 borings indicated the presence of coal and/or cinders in the shallow soils, which may be the cause of the detectable PAH concentrations at SB95-3 since no coal tar odors were noted.

As mentioned previously, two LUST sites and one LAST site existed in the locations of Sinclair Refining Co., Shell Oil Co., and Standard Oil Co. (all collectively known as Former Holmes Oil). Although the site was closed in September 2005, residual soil and groundwater petroleum impacts exist in the approximate areas shown on Figure 5. Information on the residual soil and groundwater concentrations from this site are included Appendix B3. Residual naphthalene concentrations in shallow soil range from non-detectable to 16.8 mg/kg near Eleventh Street. A residual petroleum impacted groundwater plume also exists. Groundwater flow beneath this site appears to have been influenced by the start-up of the pumping well PW-1 in November 1997 (refer to flow maps in Appendix B3). The November 1997 flow map for the Holmes site indicates groundwater flow to the west. Subsequent flow maps (January 1998 and April 2004) indicate a substantial flow to the northeast toward the pumping well. Further investigation of this property will include groundwater quality assessment, with subsurface soil sampling in an attempt to determine the source of the prior PAH concentrations.

3.6.1.3 Winter Property

The off-property gas holder was located on the Winter Property (Figure 6). Two wells and one soil boring have been completed on the property including MW01, MW06 and SB1. Residual benzene and naphthalene concentrations in soil on this property are shown on Figure 8. No soil samples were collected from MW01 or MW06 and one soil sample was collected from SB1 at 7 to 7.5 feet bgs located at the base of the holder. Concentrations of benzene and naphthalene in soil at this depth interval were identified to be 9 mg/kg and 1,700 mg/kg, respectively. The bottom of the holder was identified at 7.8 feet bgs. Further investigation of the surface and subsurface soils are needed to assess if response actions are warranted to manage the potential risk to human health and the environment.

3.6.2 Groundwater Quality

The Completion Report (December 2006, NRT) identified remaining potential upland areas of concern related to groundwater quality including:

- Shallow groundwater quality assessment to the west (Wisconsin Central Railroad Property);
- Supplemental bedrock investigation; and
- Continued groundwater monitoring.

Also, we have identified as an additional area of concern, the groundwater quality beneath the solidified soils. The ISS remediation was designed to treat subsurface MGP contamination to a depth of 32 feet along the river as shown on Figure 7. The base of the ISS did not extend to bedrock, but rather ended in native sand materials above a possible glacial till layer (refer to sheets C3 and C4, Appendix C). Thirteen verification sample locations were performed through the area of the proposed 32-foot depth ISS material as shown in Appendix D (VS-1 through VS-8 and VS-12 through VS-16). Multiple borings were performed in some locations. Based on the sixteen boring logs (VS-2, VS-3 and VS-4 location logs not available), the actual ISS depth in the area along the river typically ranged from 30 to 32 feet, with two logs indicating ISS depths of 25 feet and 28 feet. Investigation of the groundwater quality of the sand unit below the ISS material will be performed to determine the extent of groundwater contamination near the river (downgradient direction).

3.6.2.1 Groundwater Monitoring

Groundwater monitoring began in 1988, when five of the Site monitoring wells were installed (MW01 through MW05). Wells were added in 1991 (MW06), 1994 (MW07 through MW14), 1995 (MW15T through MW18T), and 1997 (MW12D, MW19T through MW21T). Currently, there are nineteen wells and piezometers on or near the Site, as three wells were abandoned (MW03, MW04 and MW11) (Figure 2).

Wells screen lengths range from 3 to 15 feet, with screened intervals at varying depths. The table below lists the wells that serve as water table wells and those that serve as piezometers, in addition to date constructed, well depth based on the well construction log, well depth based on 2007 measurement, and screen length. Only one well nest (MW12/12D) exists for estimating vertical gradient; however, this well nest is located within 10 feet of the pumping well. As noted from the table, wells MW01, MW06 and MW19T have more than one foot of discrepancy between the well construction log depth and the 2007 measured depth. These depth discrepancies will be evaluated during the RI work.

Well ID	Construction Date	Well Construction Log Well Depth (from ground surface, ft)	Estimated Well Depth from 2007 Measurement (from ground surface, ft)	Screen Length (ft)
Water Table Wells				
MW06	9/30/1991	31	29.4	10
MW07	8/31/1994	11	12.0 *	5
MW08	9/2/1994	11	12.1 *	5
MW09	9/1/1994	11	12.5 *	5
MW12	9/6/1994	14	14.6 *	5
MW13	9/6/1994	13	15.0 *	5
MW14	9/7/1994	18	nm	5
MW15T	5/15/1995	20	nm	15
MW16T	5/16/1995	17.5	nm	15
MW17T	5/17/1995	24.5	24.0	15
MW18T	5/17/1995	27	26.5	15
Piezometers				
MW01	8/23/1988	24	21.3	3
MW02	8/23/1988	24	24.8 *	3
MW05	8/23/1988	29.5	29.4	3
MW10	9/1/1994	15	15.8 *	5
MW12D	4/2/1997	35	34.9	15
MW19T	4/1/1997	40	28.3	15
MW20T	3/31/1997	40	39.0	15
MW21T	4/2/1997	39.8	39.1	15
Extraction Well				
PW-1	10/22/1997	35	nm	15

nm - not measured
* = Appears the ground surface was raised after well construction

Currently, groundwater samples are collected and analyzed for petroleum volatile organic compounds (PVOCs) and PAHs on an annual basis, typically in May. Cyanide analysis was discontinued in 2004, as allowed by WDNR, because of detections below the Wisconsin Administrative Code (WAC) NR 140 Preventive Action Limit (PAL). A discussion of contaminants of potential concern (COPCs) and a brief summary of the various compounds that have been analyzed over time are discussed in Section 3.7. Groundwater sampling results from April 2000 through May 2006 are summarized on Tables 1 and 2 for PVOCs/cyanide and PAHs, respectively.

Groundwater elevation is measured in all wells semi-annually to evaluate groundwater flow (typically in May and November) (Table 3). Groundwater elevation contours constructed prior to remediation suggest groundwater beneath the Site flowed toward the river and the horizontal gradient was relatively flat, ranging from 0.003 ft/ft in August 1988 to 0.0007 ft/ft in October 1991.

Groundwater elevations measured since 2001 suggest groundwater flow at the Site is currently influenced by the ISS soils and the drawdown effects of the extraction well (PW-1), which extracts groundwater at a rate of approximately 10 gpm and creates a localized cone of depression. Groundwater flow in the northern portion of the Site, on either side of the ISS soils, is toward the Manitowoc River, while flow in the central and western portions of the Site is generally toward PW-1. Figure 11 illustrates the current Site groundwater flow from the November 28, 2005 water level measurements.

3.6.2.2 Groundwater Remediation System

A groundwater gradient control system, consisting of a pumping well (PW-1) located at the western boundary of the Eleventh Street right-of-way, a bag filter and a granular activated carbon adsorption pretreatment system, was installed at the Site in October 1997. Start-up of this system occurred in November 1997 and has been operating since that time. The system has been operating, for the most part, at approximately 10 gpm or higher since July 2001. The flow rate gradually decreased after about September 2005, likely due to a measured increase of pressure in the carbon vessels that may be a result of iron bacteria. However, groundwater gradient control was maintained based on the November 28, 2005 water levels and sewer discharge criteria are still being met.

Well MW14 (installed near boring SB53) contains Dense Non-Aqueous Phase Liquid (DNAPL) free product. A small amount of free product (less than one-half gallon) continues to be bailed from MW14 during the semi-annual monitoring visits. Collected free product is temporarily stored in a labeled 55-gallon drum located inside the building near the groundwater pretreatment system, until it is eventually disposed at a suitably licensed disposal facility.

3.6.3 Surface Water Sampling

WDNR collected surface water samples in 1989 and 2003 from an area along the Manitowoc River where an oil sheen appeared to be rising from below the surface of the water near the former MGP. The 1989 sample indicated results for benzene, toluene and, xylene (BTX) as well as ethyl-benzene, naphthalene, cyanide (total and amenable), and oil & grease below their reported detection limits. The 2003 sample indicated a detection of possible creosote oil components from the oil sheen observance area. Two other samples collected in 2003 from 100 yards upstream and 100 yards downstream of the oil sheen observance area did not indicate the presence of petroleum compounds.

NRT and WPSC recorded oil sheen observations from five different locations along the Manitowoc River adjacent to, upstream and downstream of the former MGP from November 2003 to July 2004. Oil sheen was often observed on the river immediately adjacent to the Site. Exceptions were over the winter months during ice cover and during periodic site visits a few other times of the year. It was concluded that the possibility remains that the river oil sheen observations adjacent to the former MGP were related to coal tar residuals in the sediments documented in the NRT (October 2003b) Phase I Sediment Sampling Report.

In November 2004, WDNR sent WPSC a Public Health Consultation letter to address the presence of oil sheens in the vicinity of the former MGP. WDNR compared the NRT Phase I sediment sampling results to some of the WDNR Consensus-Based Sediment Quality Guidelines (CBSQG) (December 2003). Based on that comparison, a Wisconsin Statute 292.11 "Responsible Party" letter was issued stating that some kind of interim action needed to take place in accordance with the requirements of NR 708.11 W.A.C. because the hydrocarbon sheen is a potential health hazard, and that hazard will continue as long as the contaminant mass remains. As a result of the potential coal tar release to the environment, an institutional control (IC) was placed by WPSC in 2005 in the form of 10 warning signs along the railing above the sheet pile wall between the former MGP and the Manitowoc River.

3.6.4 Sediment Sampling

The locations and analytical results for PAHs, BTX, polychlorinated biphenyls (PCBs), and cyanide of previously collected Manitowoc River sediment data are summarized on Sheet 1.

In September 1990, the WDNR collected four petite Ponar® grab samples from the Manitowoc River adjacent to the former MGP. The sediment surface samples were collected adjacent to the sheet piling, and 20 feet, 50 feet, and 120 feet from shore; however, the exact sample locations within the river are not known. Samples collected from 20 feet (M2) and 50 feet (M1) from shore indicated the presence of benzene, toluene, ethylbenzene and xylenes (BTEX) compounds and PCB-1254.

WW Engineering & Science (WWES) performed sediment sampling in 1991 using an offshore drill rig (for borings SB21 through SB35, SB41, and SB42) and a Wildco sediment corer (for locations SD01 through SD06). Core samples collected from the drill rig ranged in depth from 4-14 feet below sediment surface, while the Wildco sediment corer penetrated 30 inches or less. Samples SB21 through SB35 were analyzed for PAHs, oil & grease, VOCs, total and amenable cyanide, and metals (lead, selenium, sulfate, and zinc). Samples SB41 and SB42 were analyzed for additional parameters related to leachate analysis.

The following observations were noted during review of the WWES analysis results:

- Total PAHs ranged from below the detection limit to 10,860 mg/kg in core samples;
- The sample locations with sediment PAHs above 450 mg/kg were generally near shore, adjacent to the former MGP;
- Benzene concentrations ranged from below the detection limit to 32,000 mg/kg in core samples; levels of BTEX and benzo(a)pyrene were also detected;
- Lead, zinc, total cyanide and oil & grease were also detected in core samples;
- Where encountered, MGP residuals were generally reported in the upper 6 feet of sediments; and
- Impacted soils were found below soft sediment in the river near the former MGP.

During June 2000, USEPA's Great Lakes National Program Office (GLNPO) and the U.S. Army Corps of Engineers (USACE) collected vibrocores and Ponar® grab samples for a screening level sediment survey on the Manitowoc River. Several of the sampling stations were in the vicinity of the former MGP. Eleven vibrocores were extended to approximately 50 inches below river bottom, while 12 Ponar® grab samples were from the top 6 to 8 inches of sediment. GLNPO screened for PAHs, oil & grease, pesticides, PCBs, VOCs, total organic carbon (TOC), total cyanide, ammonia, and metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc). Laboratory toxicity tests (using

Hyallela azteca and *Chironomus tentans*) were also conducted on grab samples. Based upon the sediment survey, GLNPO had the following conclusions:

- PAH concentrations in the sediments in the vicinity of the former MGP are elevated and potentially present an ecological and/or human health risk;
- PAHs and oil & grease are the primary contaminants of concern identified in the sediments;
- Metals and PCBs are not present in the sediments at levels that present a major ecological and/or human heath risk; and
- Historical data along with the results of the June 2000 assessment indicate a potential on-going source of contamination to the sediments of the turning basin, potentially from contaminated soil/groundwater related to the former MGP.

In May 2003, NRT conducted a sediment investigation of the Manitowoc River sediments using Ponar® grab samples and soft sediment poling observations. Poling was performed on seven transects across the river and two transects parallel to shore, at 43 locations. A petite Ponar® was used to sample the upper 4 to 6 inches of the river bottom in some poling locations. Grab samples were taken in areas where odor and/or sheen were noted during poling, and in areas to aid in delineating the extent of surficial sediment impacts. Grab samples were analyzed for BTEX, PAHs, metals (including arsenic, cadmium, chromium, copper, lead, mercury, silver, and zinc), total cyanide, PCBs, ammonia, and total organic carbon.

Grab samples confirmed BTEX and PAH impacts. Soft sediment thicknesses along the 2003 poling transects ranged from 2 inches to 7 feet 10 inches. The approximate extent of MGP impacts (coal tar or sheen) based on poling data extend from the upstream edge of the former MGP to approximately 280 feet downstream of Eleventh Street, and approximately 130 feet out from shore (Sheet 1).

3.6.5 Sediment Quality

The Completion Report (December 2006, NRT) identified remaining potential areas of concern related to sediment quality including:

- Refinement is needed on the current aerial extent of contamination and definition is needed on the profile of the contaminated sediments; and

- Further characterization may involve a risk assessment to be performed in accordance with the RI/FS work planning process.

Also, we have identified as an additional area of concern, the quality of unlithified soils that lie beneath the soft sediments of the Manitowoc River near the former MGP. Further review of the WWES boring logs and cross-sections in the river sediments indicate that elevated levels of BTEX and PAHs were found in sandy material that required 50 or more blows per foot for collection. Therefore, investigation of the river sediments will include the parent material beneath the soft river sediments.

3.6.6 Manitowoc River USACE Dredging History

The USACE maintains the Manitowoc river channel from the harbor entrance upstream to the Burger Boat Company at USACE river station 191+56. This is upstream of the former MGP site, which is at approximately USACE river station 156+50. The USACE maintains a project depth of 21 feet in the vicinity of the former MGP, and this project depth extends from the harbor river mouth upstream to river station 185+00. Upstream of this location, the USACE project depth was 12 feet, but the Water Resources Development Act of 2007 authorized a change in project depth from 12 feet to 18 feet. The entire channel is generally surveyed bi-annually by the USACE and dredging of the river is performed as needed (if USACE funds are available) to maintain the project depth.

Dredging events that have occurred in the Manitowoc River are summarized in the Annual Dredging Report/Contract Dredging Report for the Manitowoc River supplied by the USACE. Review of this report indicates that the latest dredging effort within the channel was performed in June-July 2007 and was mostly upstream of station 178+00 (upstream of the MGP site), and a limited area in the harbor. The report also indicates that the river channel in the vicinity of the former MGP was most recently dredged in 1995 and 1991. The dredging report does not fully describe which portions of the channel were dredged during events prior to 1991. At this time, we are unaware of further dredging events planned for the Manitowoc River, but it is presumed the USACE will dredge upstream of station 185+00 as soon as funds are available.

Dredged material from the river channel has been reportedly placed within the Manitowoc Confined Dredging Disposal Area (CDF) since 1976. With dredged material placed in the CDF, it is assumed that there is little or no potential for release, re-suspension, or re-deposition of probable contaminants within the CDF to the Manitowoc harbor or other portions of the river. Prior to 1976, it is unknown how much material was dredged from the vicinity of the former MGP or how dredged materials were handled.

It is assumed that the river channel in the vicinity of the former MGP will require periodic maintenance dredging by the USACE in the future. Potential site remedies to be evaluated during the FS will consider the present operational depth of the channel.

3.7 Contaminants of Potential Concern (COPCs)

Based on the Generalized Conceptual Site Model (CSM) and the Multi-Site Risk Assessment Framework (RAF), the general COPCs are considered to be PAHs, PVOCs, phenols (2,4-dimethylphenol, 2-methylphenol, 4-methylphenol, and phenol), and inorganics (aluminum, antimony, arsenic, barium, cadmium, chromium, copper, cyanide, iron, lead, manganese, mercury, nickel, selenium, silver, vanadium, and zinc).

The following table summarizes Site COPCs for each media to be evaluated. A site-specific summary of the sampling and analysis plan, presented generically in the Multi-Site Quality Assurance Project Plan (QAPP) and Multi-Site Field Sampling Plan (FSP) is provided on Table 4. Table 4 also includes analytical data needs to support the FS.

Media	COPCs
Soil	PVOCs, PAHs, cyanide, lead and vanadium
Groundwater	PVOCs, PAHs; and aluminum, iron, manganese, and vanadium (metals - minimum one round) and available cyanide (minimum one round)
Soil Vapor (if determined necessary)	BTEX and Naphthalene
Sediment	PVOCs, PAHs, phenols, cyanide, aluminum, antimony, barium, copper, iron, lead, manganese, nickel, selenium, silver, vanadium, and zinc
Surface Water	PVOCs, PAHs, phenols, cyanide, aluminum, antimony, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, vanadium, and zinc

Environmental samples were collected as part of the Site Investigation by EDI Engineering & Science (EDI) in 1988; during additional investigation, remedial planning, documentation and post-remedial groundwater monitoring by WWES/ Earth Tech in 1991 through 1994; during post-remedial groundwater monitoring and/or sediment sampling by Horizon Environmental (1998-2001), GLNPO (2000), and NRT (2002-present). A summary of previous sample media and chemical analytes follows:

Phase of Work/Report	Soil	Groundwater	Sediment
EDI 1988 SI	VOCs, base/neutrals (B/N), metals*, total and amenable cyanide (T+A Cn)	VOCs, B/N, metals*, T+A Cn, sulfate	N/A
WWES 1991 SI	VOCs, PAHs, lead (Pb), selenium (Se), Zinc (Zn), T+A Cn, sulfate, grease & oil	VOCs, B/N, Pb, Se, Zn, T+A Cn, sulfate, grease & oil	VOCs, PAHs, Pb, Se, Zn, T+A Cn, sulfate, grease & oil
WWES 1993 Pilot Test Report	VOCs, Semi-volatile organic compounds (SVOCs), metals*, T+A Cn, sulfate	N/A	VOCs, SVOCs, metals*, T+A Cn, sulfate
WWES April 1993 Sampling, Work Plan for ISS	VOCs, PAHs, metals*, T+A Cn	N/A	N/A
WWES September 1993	VOCs, SVOCs, metals*	N/A	N/A

Phase of Work/Report	Soil	Groundwater	Sediment
Characterization Sampling			
WWES 1994 Shallow Soils Excavation Interim Closure	VOCs, SVOCs, metals*, T+A Cn, sulfate	VOCs, SVOCs, metals*, T+A Cn, sulfate	N/A
Earth Tech 1995 Interim Closure Report	N/A	VOCs, B/N, metals*, T+A Cn, sulfate	N/A
Horizon May 1995 Subsurface Investigation of Adjacent Properties	PVOCs, SVOCs, T+A Cn	PVOCs, SVOCs, T+A Cn, Sulfate, Zn	N/A
Horizon June 1996 Subsurface Investigation	PVOCs, SVOCs, T+A Cn	N/A	N/A
Horizon 1998-2001 Annual Groundwater Monitoring	N/A	PVOCs, SVOCs, T+A Cn	N/A
GLNPO 2000 Survey of Sediment Contamination on the Manitowoc River	N/A	N/A	VOCs, PAHs, PCBs, Pesticides, metals*, T Cn, ammonia, Oil & grease
NRT 2002-2003 Groundwater Monitoring and Sediment Sampling	N/A	PVOCs, PAHs, T+A Cn, weak-acid dissociable (WAD) Cn	BTEX, PAH, PCBs, metals*, T Cn, ammonia
NRT 2004 Groundwater Monitoring	N/A	PVOCs, PAHs, Available Cn	N/A
NRT 2005-present Groundwater Monitoring	N/A	PVOCs and PAHs	N/A

* Metals analyzed during the 1988 investigation included antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium and zinc. Analyses of antimony, beryllium and thallium were eliminated during subsequent investigations, which also included barium. Metals analyzed during the GLNPO 2000 investigation included arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc. Metals analyzed during the NRT 2003 investigation include arsenic, cadmium, chromium, copper, lead, mercury, silver, and zinc.

As noted above, early investigations through 1991 included analysis of soil and groundwater samples for VOCs, base/neutral semi-volatile organic compounds (base/neutral SVOCs) or PAHs, total and amenable cyanide, metals, sulfate and grease and oil. Grease and oil was eliminated following review of the 1991 data, as it was observed that soils and groundwater impacted with grease and oil were also impacted by PAHs or base/neutral SVOCs and VOCs, and the analysis was not necessary. Sulfate is not considered a COPC based on the Multi-Site RAF. The full list of SVOCs was performed during several soil and groundwater sampling events from 1993 through 2001. This list includes the acid extractable SVOCs (i.e. phenols).

Soil COPCs – PVOC and PAH compounds are elevated in soil and are considered COPCs. Continued cyanide (total) sampling in soil is recommended to characterize the former MGP structures, particularly the former purifier areas. Also, continued sampling for lead in soil is recommended due to a past lead concentration of 490 mg/kg at SB1 inside the former 300,000 cubic foot gas holder. Concentrations of other metals are below the EPA Soil Screening Levels (SSLs) for ingestion-dermal or inhalation pathways (commercial/industrial scenario). The maximum arsenic concentration (3 mg/kg) is just above the SSL, but within typical background levels. Vanadium is included on the COPCs list as it was never analyzed in soil at the Site. Although aluminum, iron and manganese were also never analyzed, no EPA SSLs exist for these compounds for human health risk assessment. As indicated in Section 4, ecological risk assessment for soils is not necessary. The phenol compounds listed in the Multi-Site RAF were not previously detected in soil at the Site, and therefore they are not included on the COPCs list.

Groundwater COPCs - Current groundwater analytes at the Site include PVOCs and PAHs and are considered COPCs. Groundwater samples through 1995 and also in May 2005 (refer to Appendix G1 for results) were analyzed for the full list of VOCs. Carbon tetrachloride, trichloroethene and methylene chloride have historically exceeded the WAC NR 140 Enforcement Standard (ESs) in isolated occurrences. As these compounds are not typical MGP-related constituents, sampling of PVOCs only began in 1995. Groundwater analyses of metals were discontinued in 1995 as concentrations in 1994 were not above the NR 140 ES, with the exception of lead at MW12 (lead was also present in the equipment blank). Zinc concentrations were above the NR 140 ES at wells MW01 and MW02 in 1991, but is likely related to the wells being constructed of galvanized steel. Groundwater samples continued to be submitted for analysis of total and amenable cyanide through 2002. Beginning in 2002, weak-acid dissociable cyanide was also analyzed. In 2004, sampling of cyanide was transitioned to available cyanide only by OIA-1677 method based on WDNR correspondence. The resulting concentrations were below NR 140 PAL and with WDNR's concurrence; cyanide sampling was discontinued at the Site thereafter. Because of new depths and areas being investigated, available cyanide will be included in the COPCs list for a minimum of one round. Since the phenol compounds listed in the Multi-Site RAF were detected below the NR 140 ES, they are not included on the COPCs list. Since aluminum, iron, manganese, and vanadium were never analyzed in groundwater at the Site, they are included in the COPCs list for a minimum of one round of groundwater sampling. Based on the initial results of these compounds in groundwater, they will be discontinued if concentrations are below screening values presented in the Multi-Site RAF.

Soil Vapor COPCs (if determined necessary) – BTEX and naphthalene compounds are elevated in both soil and groundwater at the Site, and are therefore considered COPCs for soil vapor. These compounds are volatile or semi-volatile and are the primary constituents of concern with respect to soil vapor.

Sediment COPCs – PVOCs, PAHs and cyanide are considered COPCs for sediment. Since phenols were never analyzed in sediment at the Site, they are included in the COPCs list. At locations previously analyzed, arsenic, cadmium, and chromium were all detected below ecological screening levels and have been removed from the COPCs list. At locations previously analyzed, mercury was detected at or below ecological screening levels and also has been removed from the COPCs list. The remaining metals from the Multi-Site RAF will be included in the COPCs list.

Surface Water COPCs – Due to the limited data collected to date on surface water, the complete COPCs list, as presented in the Multi-Site RAF, will be analyzed for surface water.

4 SITE-SPECIFIC CONCEPTUAL SITE MODEL SUMMARY

A Site-Specific Conceptual Site Model (CSM) was developed for the Manitowoc Former MGP Site (Figure 12). The Site-Specific CSM is based on the Generalized CSM. It is refined to reflect: (1) site-specific conditions observed during the Site reconnaissance (discussed below) and (2) information summarized in the Completion Report (December 2006, NRT). The Site-Specific CSM provides the framework to identify data needs to characterize the Site and evaluate potential human health and ecological risks.

The Site-Specific CSM and risk assessment approach will be reviewed on an iterative basis to refine the media of concern and individual pathways as more data are generated to ensure the RI report considers the newly collected data. Similarly, as remedial actions are performed, the CSM will be revised.

4.1 Site Reconnaissance

The Site reconnaissance field notes are provided in Appendix E and include select photographs and the completed habitat assessment checklist from the Ecological Risk Assessment Guidance for Superfund (ERAGS) (USEPA 1997). The site reconnaissance was completed prior to submittal of Revision 1 of the RAF, which includes the use of an additional habitat assessment form.

The Site reconnaissance was performed on January 5, 2007 by NRT and Exponent (formerly Menzie-Cura and Associates, the risk assessors) staff as part of the RI work plan development. The primary purpose of the Site reconnaissance was to verify which exposure pathways may be complete for both human health and ecological receptors. A qualitative habitat assessment was performed as a beginning step of the screening level ecological risk assessment to assess if sufficient ecological habitat is present in the upland portions of the Site. The qualitative habitat assessment will be confirmed during the warmer weather, concurrently with the RI field activities, when the full quality of the habitat can be evaluated. Refinement to the site-specific CSM will be made as appropriate. The observations from the Site reconnaissance are incorporated in the assessment of potential exposure pathways set forth in the following sections.

4.2 Media of Potential Concern

The Generalized CSM considered the following media as media of potential concern:

- Soil (Surface and subsurface soil)
- Surface Water
- Groundwater
- Sediment

These media will also be considered media of potential concern, as described in the following sections. In addition, soil vapor may also be considered a media of potential concern; however, this will be determined following further characterization of the potential source areas under the on- and off-property buildings. These media will be evaluated as part of the risk assessment activities to assess if response actions, including risk management tools, are warranted to manage the potential risk to human health and the environment at the Manitowoc Site.

The risk assessment evaluation of these media will be based on previously collected RI data and data to be collected as described in Section 6. The previously collected data will be assessed for the adequacy of the data as part of the RI Report. The assessment will consider the age and quality control of the data, detection limits, the likelihood that the data is still representative of conditions, and may include comparison with newly collected RI data.

4.2.1 Surface Soil

Surface soil is considered a media of potential concern on-property and off-property at the Winter Property due to the presence of former MGP structures requiring further characterization as described in Section 3.6.1.1 and 3.6.1.3, respectively. Previously performed response actions (Section 2.4) included ISS and excavation of shallow soils over an area located both on-property and on City-owned land and right-of-way (North Eleventh Street). However, surface soils located on-property south of the building and portions of the Winter Property are considered a potential exposure pathway.

4.2.2 Subsurface Soil

Subsurface soil is considered a media of potential concern as MGP residuals were detected in subsurface soil during previous investigations. Subsurface soil requires further investigation in the potential source areas (former MGP structures) as described in Section 6.4 to assess potential human health risks.

4.2.3 Soil Vapor (pending subsurface soil quality)

Soil vapor, relating to vapor intrusion into buildings, may be considered a media of potential concern for buildings on the Site. Recommendations on whether soil vapor sampling is warranted are discussed in Section 6.5.

4.2.4 Groundwater

Groundwater is considered a media of potential concern as MGP residuals were detected in groundwater samples during previous investigations and on-going annual groundwater monitoring events. Additional groundwater data are needed to define the vertical and horizontal extent of the plume and associated environmental risk, as described in Section 6.6.

4.2.5 Sediment

Sediment in the Manitowoc River will be evaluated as a media of potential concern. Previously performed investigations detected MGP residuals in sediment samples collected from the river. Further investigations are needed as described in Section 6.7 to assess both human health and ecological risks.

4.2.6 Surface Water

Surface water in the Manitowoc River will be evaluated as a media of potential concern. Oil sheens have been observed on the river adjacent to the Site that may potentially be related to MGP coal tar residuals. Further investigations are needed as described in Section 6.7 to assess both human health and ecological risks.

4.3 Potential Exposure Pathways – Human Health

This section evaluates the potential exposure pathways for human health receptors as presented in the Generalized CSM. A site-specific evaluation of the Generalized CSM exposure pathways has been considered to develop the former Manitowoc MGP CSM. This evaluation considers both current Site land use as well as potential future Site land use conditions.

These exposure pathways will be evaluated as part of the risk assessment activities to assess if response actions, including risk management tools, are warranted to manage the potential risk to human health at the Manitowoc Site. It is understood that without proving unrestricted use and unlimited access is protective of human health for current and future land uses, risk management tools will be required to prevent residential land use of the Site. The methods that will be used to evaluate potentially complete exposure pathways are included in the Multi-Site RAF.

Ingestion of groundwater is not expected under any current or future land uses because there is a public water supply, and therefore this media pathway was dropped from the Generalized CSM. Groundwater ingestion will not be quantitatively evaluated. State and federal drinking water standards will be used to qualitatively evaluate groundwater ingestion. This evaluation will be documented in the Baseline Risk Assessment (BIRA).

4.3.1 Industrial/Commercial Land Use Scenario - Worker

The Generalized CSM considered the exposure route to the industrial/commercial worker was through incidental ingestion, dermal contact, and inhalation of soils (as a result of soil disturbance). Two main properties exist within known contaminated areas (not previously remediated) that each contain a building for commercial use, asphalt parking area and grass/landscape areas. Based on the current land use, industrial/commercial workers could be exposed to MGP residuals if present near the surface in the limited grass/landscape areas or if the soil under the asphalt would be exposed. The most likely workers coming in contact with the Site on a regular basis would be maintenance personnel for each property, consistent with the Generalized CSM. Exposure to these personnel is expected to be minimal due to the paved areas and established grass areas. Dermal exposure and ingestion of groundwater is not expected due to the depth to groundwater (ranging from 5 to 22 feet bgs – below depths encountered for landscaping activities) and public water supply.

An additional worker exposure scenario for this Site, not included in the Generalized CSM, may include potential inhalation of vapors as a result of vapor intrusion. Both buildings were constructed over former MGP structures. Subsurface soils beneath or immediately adjacent to the buildings will be investigated to evaluate if conditions indicate that soil vapor intrusion is potentially an issue. The basement floor of the on-property building is exposed along the north side. A basement likely does not exist for the Winter Building due to the shallow depth to the base of the gas holder (approximately 7 feet).

In summary, the commercial/industrial worker scenario will be assessed using existing Site data of sufficient quality (as discussed in Section 4.2) and proposed additional data to evaluate potential risks under the following exposures:

- Incidental ingestion of soil (surface and subsurface);
- Dermal contact with soil (surface and subsurface) as a result of soil disturbance;
- Inhalation of vapors and dusts as a result of surface soil disturbance; and
- Soil vapor (if warranted as described in Section 6.5).

4.3.2 Construction Worker

The Generalized CSM considered the exposure route to the construction worker was through incidental ingestion, dermal contact, and inhalation of soils (as a result of soil disturbance) and groundwater via dermal contact and inhalation.

Consistent with the Generalized CSM, there is the potential that construction workers may be exposed to surface and subsurface soils and groundwater if portions of the Site are redeveloped or if subsurface utility work occurs. Using previously collected data of sufficient quality (as discussed in Section 4.2) and proposed data, the potential risks associated with construction worker exposure to soils and groundwater will be evaluated, including:

- Incidental ingestion of soil (surface and subsurface);
- Dermal contact with surface/subsurface soil and groundwater associated with excavation activities; and
- Inhalation of vapors and dusts derived from surface/subsurface soil and groundwater with excavation activities.

4.3.3 Recreational Land Use Scenario – Visitor/Trespasser

The Generalized CSM considered the exposure route to the recreational visitor/trespasser was through incidental ingestion and dermal contact with surface soil, incidental ingestion and dermal contact with surface water and sediment. Under current land use conditions, there is the potential that visitors/ trespassers may be exposed to surface water and sediment via wading into the river. The river is wide (approximately 400 feet across) with an elevated concrete platform (atop the sheet pile wall) and a metal railing present throughout most of the river bank adjacent to the City Property. There is no obvious location to easily access the Manitowoc River. During the Site reconnaissance, Exponent waded into the Manitowoc River by traversing a steep embankment down to the shoreline. Exponent noted there was only a limited distance out into the river that was possible for wading. Water depths were approximately two to three feet deep within five feet of the shore and the river bottom drops abruptly from this point. Water depths are known to be more than 21 feet at a distance of approximately 60 feet from the shoreline.

Under a future land use scenario, recreational use of the Winter Property, in addition to the waterfront area on the City Property and Wisconsin Central Railroad property, will be evaluated. The exposure routes considered for the recreational land use scenario at the Manitowoc Site are consistent with the Generalized CSM. Using proposed surface soil, sediment, and surface water data, the potential risks associated with recreational land use exposures will be evaluated as follows:

- Incidental ingestion of surface soil, surface water, and sediment; and
- Dermal contact with surface soil, surface water, and sediment.

Human health screening levels for surface water and sediment will be tailored to the Site-Specific characteristics of the Manitowoc River and will be developed as part of the Risk Assessment.

4.3.4 Residential Land Use Scenario

The Generalized CSM considered the residential land use exposure route to be through surface incidental ingestion, dermal contact, and inhalation of surface soil, subsurface soil, and groundwater.

Although there is no indication that future use of this Site will be residential, the Site-Specific CSM will include flexibility for evaluating a residential land use scenario within the BIRA, particularly on the City-owned property. It is WPSC's intention to use risk management tools or to maintain the WPSC property under ownership. As appropriate, Site property that is not WPSC-owned may also require risk management tools to control future residential development, which will be documented in the BIRA.

4.4 Potential Exposure Pathways – Ecological Receptors

This section evaluates the potential exposure pathways for ecological receptors as presented in the Generalized CSM. A site-specific evaluation of the Generalized CSM exposure pathways has been considered to develop the Manitowoc CSM. As discussed in Section 5.4 of the Generalized CSM, all of the potential ecological receptors are considered applicable for evaluation in the Screening Level Ecological Risk Assessment (SLERA). The results of the qualitative habitat assessment conducted in January 2007 for the Manitowoc Site were used to identify the ecological receptors to be evaluated in the SLERA, which include fish and benthic invertebrates as further discussed below.

The results of the habitat assessment (Section 2.3.1 of the RAF), performed during the site reconnaissance, are used to refine the Manitowoc CSM. Field notes and photos from the habitat assessment are included in Appendix E. As described in Section 4.1, the habitat quality assessment will be confirmed as part of the RI field work. The site-specific CSM will be refined, as appropriate.

Wetlands are not present at the Site based on site observations and review of the Wisconsin wetland inventory map for the area. The methods that will be used to evaluate the potential exposures to these ecological receptors are included in the Multi-Site RAF.

4.4.1 Mammals (Upland and Aquatic)

The Generalized CSM considered carnivorous, piscivorous, insectivorous, omnivorous, and herbivorous mammals as an ecological receptor that may be exposed to COPCs through incidental ingestion and dermal exposure of soil, sediment, and/or surface water and ingestion of plant and prey items.

Based on the Site reconnaissance and the habitat assessment (refer to Appendix E), the Site does not provide sufficient habitat for mammals in the upland areas. The Site is primarily asphalt parking areas, buildings and paved streets. There are no natural terrestrial ecological communities present at the Site that would afford habitat for small mammals beyond those normally found in any city environment. For example, there are no forest lands at the Site or grasslands that would provide high quality habitat for a range of small mammal species or other wildlife. No evidence of wildlife usage was observed during the Site reconnaissance.

Based on the Site reconnaissance and the habitat assessment (refer to Appendix E), the Manitowoc River does not provide sufficient habitat for mammals in the aquatic environment. The shoreline of the river consists of a sheet pile wall and steep embankments which limits burrowing of aquatic mammals such as muskrats and beavers. This area of the river is deep due to its use as a turning basin and aquatic vegetation is not present.

For the above mentioned reasons related to insufficient habitat, potential risk to mammals in the upland and aquatic areas will not be further evaluated.

4.4.2 Birds (Upland and Aquatic)

The Generalized CSM considered carnivorous, piscivorous, insectivorous, omnivorous, and sediment-probing birds as an ecological receptor that may be exposed to COPCs through incidental ingestion and dermal exposure of soil, sediment, and/or surface water and ingestion of plant and prey items.

Geese and seagulls were observed using the area of the river near the property during the Site reconnaissance visit. Most other avian species had migrated south for the winter at the time the habitat assessment was conducted. However, based on the observations made during the habitat assessment, little habitat exists in the area for birds. Sediment probing birds would unlikely be using the Site as the water depths are generally too deep. Mudflat areas are not present adjacent to the river and the water depth is approximately two feet adjacent to the shorelines and then drops off quickly to depths greater than 10 feet deep. Piscivorous and insectivorous bird species may forage in the Manitowoc River near the Site, but this would be expected to be limited in nature as there are not nesting sites available for these bird species at the Site. Consistent with the lack of sufficient habitat provided at the Site for mammals, bird habitat is considered insufficient in the upland and aquatic areas and will not be further evaluated.

4.4.3 Fish

The Generalized CSM considered fish as an ecological receptor that may be exposed to COPCs through incidental ingestion and dermal exposure of sediment and/or ingestion of food.

A variety of fish species may be present in the Manitowoc River portion of the Site. Fish will be considered an ecological receptor because habitat at the site does exist. As described in Section 6.1.2.1 of the RAF, a qualitative biological survey of fish habitat will be performed during surface water and sediment investigation. The qualitative habitat survey will identify the types of fish habitat that exists (e.g., spawning grounds, foraging areas, etc.), if present, over the investigation area. Also, the habitat survey will evaluate whether sufficient habitat is available for the potential threatened fish species discussed in Section 3.5. Together with the concentrations of COPCs in surface water and sediment, the spatial distribution, the habitat information, and the ability of the detected COPCs to bioaccumulate or biomagnify in fish tissue, the need to further evaluate potential risks to fish as part of the ecological risk assessment will be determined.

4.4.4 Benthic Invertebrates (Aquatic Ecological Receptor)

The Generalized CSM considered benthic invertebrates as an ecological receptor that may be exposed to COPCs in sediment and surface water.

MGP residuals were detected in sediment samples collected in the Manitowoc River. Many of the detected concentrations are above ecological screening levels, indicating that the sediment media requires further evaluation to assess if sediment poses an ecological concern. As discussed in Section 5.4.4 of the RAF, benthic invertebrates form the base of many food chains and spend most or all of their life-cycle burrowed or feeding just at the interface between surface water and sediment.

Based on observations from the Site reconnaissance, the river provides habitat for benthic invertebrates as benthic invertebrates were observed in the river (Appendix E). Therefore, the potential risks to benthic invertebrates associated with sediment and surface water exposures from the Manitowoc River will be evaluated as part of the ecological risk assessment.

4.5 Data Needs

As described in the Completion Report (December 2006, NRT) and previous sections of this SSWP, the media that require further assessment and/or were not fully addressed by previous work with respect to public health, welfare or the environment include the following:

- On-property and off-property (Winter) surface soil sampling will be performed to assess current conditions in remaining potential source areas and provide additional data for assessment of alternatives and pathways;
- On-property and off-property (Winter) subsurface soil sampling will be performed to assess current conditions in remaining potential source areas, evaluate the potential for vapor intrusion, and provide additional data for assessment of alternatives and pathways;
- Groundwater well installation and sampling will be performed to define the lateral and vertical extent of MGP residuals in groundwater and evaluate concentrations trends;
- Surface water sampling will be performed to assess the distribution of COPCs and the potential risk to human health and the aquatic environment; and
- Sediment sampling will be performed to assess the distribution of COPCs and the potential risk to human health and the aquatic environment. In addition, geotechnical parameters will be collected to support and FS.

5 PROJECT SCOPING AND PLANNING ACTIVITIES

5.1 Project Scoping (Task 1)

As defined in the SOW, attached to the AOC, the scope of this project includes:

- Task 1: Project Scoping and RI/FS Planning Documents;
- Task 2: Community Relations;
- Task 3: Site Characterization;
- Task 4: Remedial Investigation Report (including human health and ecological risk assessments);
- Task 5: Treatability Studies (if needed);
- Task 6: Development and Screening of Alternatives (Technical Memoranda);
- Task 7: Detailed Analysis of Alternatives (FS Report); and
- Task 8: Progress Reports.

Task 1, Project Scoping and RI/FS Documents included the use of Multi-Site documents which set forth general approaches and concepts with the intent of streamlining preparation of work plans and minimizing review times for future deliverables. In addition, the Multi-Site documents provide a consistent approach to investigating and assessing WPSC's sites. Multi-Site documents include:

- Multi-Site Health and Safety Plan (HASP) Revision 2 (August 2, 2007);
- Multi-Site Quality Assurance Project Plan (QAPP) Revision 2 (September 24, 2007);
- Generalized Conceptual Site Model (CSM) Revision 0 (August 5, 2007);
- Multi-Site Risk Assessment Framework (RAF) Revision 0 (September 5, 2007);
- Multi-Site Field Sampling Plan (FSP) Revision 3 (February 20, 2008); and
- Multi-Site Feasibility Study (FS) Support Documents (to be prepared).

These Multi-Site documents are intended to set forth the general approaches and concepts for performing RI/FS activities. Site-specific information relevant to these documents is included in Appendix F.

Previously collected data and observations were compiled in the Manitowoc Completion Report (December 2006, NRT), submitted to USEPA on December 5, 2006. The conclusions of the Completion Report and Site reconnaissance were used as the basis for developing this SSWP.

5.2 Approach

Previously performed Site activities have generated a significant amount of existing data for characterizing Site conditions. The activities proposed in this SSWP will focus on the supplementing previously collected data to refine migration and exposure pathways identified through the CSM and Site reconnaissance.

Sampling activities will also be completed to gather data that can be used to support human health and ecological risk assessments and feasibility study evaluations. A dynamic work plan approach has been developed to collect the data necessary to satisfy the Data Quality Objectives (DQOs) and address concerns regarding specific pathways.

Representatives from USEPA, USEPA's technical support team, WPSC and WPSC's consultants will participate in technical meetings to mutually resolve problems, as necessary.

5.3 Project Management Communications

Appendix F4 includes the lines of communication that will be used during field activities with the contact information. Additional team members may be added throughout the project duration.

It is anticipated at a minimum, during field activities that require rapid decision-making a weekly meeting will be used to provide a schedule update and to discuss problems that have occurred and resolutions that have been implemented. The frequency of these meetings may be increased depending on the specific activity being performed.

These meetings will include the Field Team Leader, NRT Project Manager, WPSC Project Coordinator and USEPA Remedial Project Manger.

5.4 Purpose and Data Quality Objectives Review

DQOs for the Former Manitowoc MGP Site are consistent with the DQOs presented in the Multi-Site QAPP. As discussed in Section 1, data will be collected during the RI activities to satisfy the following site-specific objectives:

- Evaluate the nature and extent of MGP residuals in the Manitowoc River sediment and surface water;
- Evaluate the presence of MGP residuals in surface soils and evaluate the presence of MGP residuals in subsurface soil at the Site;
- Assess soil conditions beneath or immediately adjacent to the buildings for an indication of the potential for vapor intrusion;
- Evaluate the nature and extent of MGP residuals in groundwater at the Site and assess the characteristics of the residual plume;
- Support development and evaluation of potential remedial alternatives (feasibility studies), if response actions are necessary; and
- Collect data to support a baseline risk assessment for human health and the environment and evaluate the potential risk for human health and ecological receptors.

5.5 Preliminary Objectives for Remedial Action

The objectives for remedial action will be developed as part of the FS tasks described in Section 8.1.1. In general, the remedial action objective is to protect public health, welfare and/or the environment from site contaminants that may pose a risk and if a risk is present, reduce the risk.

5.6 Preliminary Remedial Action Alternatives

The remedial action alternatives will be developed as part of the FS tasks described in Section 8.2 and will include site-specific evaluation of Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered (TBC) requirements.

Previous remedial action alternatives were evaluated prior to selecting the response actions discussed in Section 2.4. These response actions may be reviewed and updated to reflect current Site conditions. In general, the following responses (but not limited to) may be appropriate to address MGP residuals:

- **Groundwater**
  - Containment
  - Active remediation
  - Monitored natural attenuation
  - Institutional controls
- **Soil**
  - Removal and disposal
  - In-situ treatment
  - Capping/containment
  - Institutional controls
- **Soil Vapor (if determined necessary)**
  - Engineering or institutional controls on building
  - Source removal and disposal
- **Sediment**
  - Dredge/excavate and disposal
  - In-situ treatment
  - Capping
  - Monitored natural recovery

5.7 Community Relation (Task 2)

WPSC is prepared to provide community relation support if requested by USEPA.

6 SITE CHARACTERIZATION AND ASSESSMENT ACTIVITIES

The scope of supplemental RI Site characterization and assessment activities addressed by this SSWP includes:

- Supplemental Site-wide survey work;
- Surface soil sampling;
- Subsurface soil sampling;
- Additional groundwater monitoring well installation;
- Groundwater sampling;
- Surface water sampling; and
- Sediment assessment.

Sampling locations, frequencies, analytical parameters, and methods to be used are presented. Work preparation, mobilization, site-specific dynamic sampling and analysis techniques, investigative waste management, record keeping, sample analysis and validation, and data evaluation processes are also discussed.

The planned field activities will be completed in accordance with the methods and techniques described in the Multi-Site QAPP, FSP, and HASP. These general methods and techniques are not repeated herein. Site-specific information relevant to these Multi-Site documents are discussed below and details are included in Appendix F.

6.1 Mobilization Planning

6.1.1 Pre-Mobilization

Field mobilization activities will be completed in accordance with Section 3 of the Multi Site FSP and include:

- Making arrangements for Site access;
- Review shipping calendar;
- Utility notification/and location through Wisconsin Diggers Hotline and, if need be, a private contractor. The City of Manitowoc representatives may need to be contacted directly for locating storm and sanitary sewers and water main lines; and
- Establishing a communication structure for field to office personnel and for WPSC and USEPA/WDNR so that they are also kept aware of the status of field activities.

6.1.2 Daily Planning

Daily planning will occur as described in the Multi-Site FSP and HASP including but not limited to:

- Daily progress tracking;
- Problem identification and resolution;
- Communications from field to office managers, WPSC and USEPA, as appropriate to insure decision points and objectives for the work are fulfilled; and
- Safety meetings, particularly with respect to the sediment and surface water sampling work on the Manitowoc River, due to the inherent danger of working in the river environment.

6.1.3 Demobilization

Generally, demobilization planning will occur during the pre-mobilization planning, as NRT staff and outside contractors plan for the field activities. Any issues regarding final Site status will be identified during the planning process (e.g. ensuring that landscaping issues are addressed, etc.).

6.2 Site Surveying and Map Development

Numerous surveying efforts have been completed over the years to locate sampling locations and notable features. Generally, the survey datum used was NAD83 (state plane coordinates) or the Wisconsin County Coordinate System datum for Manitowoc County. A new survey will be completed in accordance with the survey methods in Section 7 of the Multi-Site FSP. This will ensure that all Site features are accurately located and that conversion of the survey points to the Universal Transverse Mercator (UTM) projection, which is required by USEPA, is consistent.

Updated survey work and mapping will include:

- Establishing additional location survey information, if needed, such that drawings and maps can be updated to show current Site features, particularly on properties not owned by WPSC (e.g., Winter and Wisconsin Central Railroad Properties); and
- Establishing new survey control points so that future Site activities (e.g. sediment sampling locations, soil boring locations, additional wells, etc.) can be accurately located and tied to a common datum as work progresses.

6.3 Surface Soil Sampling

6.3.1 On-Property Locations

Surface soil samples from the 0 to 2 feet depth interval will be collected on-property to assess current conditions in the former MGP structure locations and provide additional data for the FS. Discrete surface soil samples are proposed to be collected from four borings (SB106, SB108, SB111 and SB113) inside the current building footprint to assess soil conditions and potential vapor intrusion (discussed further in Section 6.5), and five borings (SB114 through SB118) on the south side of the building located in grass areas as shown on Figure 13. Access to locations inside the current building, appear to be feasible due to overhead garage doors, pending further review of access constraints.

6.3.2 Off-Property Locations (Winter Property)

Surface soil samples from the 0 to 2 feet depth interval will be collected off-property (on the Winter Property) to assess current conditions in the former 300,000 cubic foot gas holder location and provide additional data for the FS. Discrete surface soil samples are proposed to be collected from three borings (SB119 through SB121) outside the former gas holder and two borings (SB122 and SB124) inside the former gas holder, all currently located in grass areas as shown on Figure 13. No surface soil samples are proposed to be collected inside the building footprint due to the difficulty in obtaining these samples. Surface soil samples to be collected exterior to the building but within the former gas holder footprint are expected to be representative of soil conditions within the entire gas holder based on the physical layout of the structure, building and proposed locations (Figure 13).

6.3.3 Sampling Methods and Abandonment

Surface soil samples will be collected using direct-push sampling techniques, which are described in Section 4 of the Multi-Site FSP. One discrete sample of surface soil (0 to 2 feet depth interval) will be collected from each location for analysis of the parameters and associated methods listed on Table 4. Cyanide will be analyzed in a fixed-based laboratory. Other parameters will be analyzed in either an on-site mobile laboratory or a fixed-based laboratory, which may depend on whether the soil sampling is performed congruent with the sediment sampling. Most boring locations will also be used for subsurface soil sample collection and following completion, the soil borings will be abandoned in accordance with the methods described in Section 4 of the Multi-Site FSP.

6.4 Subsurface Soil Exploration and Sampling

6.4.1 On-property Locations

A test pit exploration (TP101) will be performed on-property in the former condenser area in the vicinity of SB58 to determine whether the suspected coal tar underground storage tank (UST) remains in this area (Figure 13). Specifically, the UST was found during both the ISS and excavation activities at approximately 3 to 6 feet bgs. The eastern half of the UST was reportedly encapsulated by ISS. If found, the tank and tank contents will be removed (if possible) and disposed in accordance with applicable regulations. If the UST is required to be left in-place, the tank contents (if any) will be removed and disposed accordingly, and the tank will be abandoned in-place and filled with inert materials in accordance with applicable regulations. No subsurface soil samples are anticipated for collection from the test pit.

Subsurface soil samples will be collected on-property to assess current conditions in the former MGP structure locations and provide additional data for the FS. Subsurface samples are proposed to be collected from three soil borings (SB103 through SB105) performed on the north side of the current building, eight soil borings (SB106 through SB113) inside the current building footprint, and five borings (SB114 through SB118) on the south side of the current building as shown on Figure 13. Access to locations inside the current building appears feasible due to overhead garage doors, pending further review of access constraints. Historic sampling information will be used as a basis for proposed boring depths. Generally, soil borings will be advanced approximately 20 feet bgs, or until a minimum of 4 consecutive feet of soil that exhibits no MGP impacts (by visual observation and field PID screening) is encountered, unless refusal occurs at a shallower depth.

6.4.2 Off-Property Locations

Subsurface soil exploration is planned off-property on: 1) City Property; 2) the Winter Property; and 3) Wisconsin Central Railroad Property.

6.4.2.1 City Property

Soil borings (SB100, SB101 and SB102) will be performed for exploration purposes on City Property/ right-of-way adjacent to the river to assess groundwater quality and the potential for remaining source in the sand unit below the ISS material. Soil samples may be collected of the sand unit below the ISS material from these borings if field observation and/or screening indicate the presence of MGP impacts. Also, groundwater grab samples will be collected from these locations, as described in Section 6.6.2.2 (Groundwater Evaluation, City Property), to determine the location(s) for installation of a piezometer. Refer to Section 6.6.2.2 for further details regarding methods for performing these borings and selection of location(s) for piezometer installation.

6.4.2.2 Winter Property

Subsurface soil samples will be collected on the Winter Property to assess current conditions in the former 300,000 cubic foot gas holder area and provide additional data for the FS. Subsurface samples are proposed to be collected from three soil borings (SB119 through SB121) located outside the former gas holder and three borings (SB122 through SB124) inside the former gas holder as shown on Figure 13. If soil conditions inside the holder appear consistent, subsurface samples may not be collected at all three boring locations. No subsurface soil samples are proposed to be collected inside the building footprint due to the difficulty in obtaining these samples. Subsurface soil samples to be collected exterior to the building, but within the former gas holder footprint, are expected to be representative of soil conditions within the entire gas holder based on the physical layout of the structure, building and proposed locations (Figure 13). Historic sampling information will be used as a basis for proposed boring depths. Generally, soil borings will be advanced approximately 20 feet bgs, or until a minimum of 4 consecutive feet of soil that exhibits no MGP-impacts (by visual observation and field PID screening) is encountered, unless refusal occurs at a shallower depth.

6.4.2.3 Wisconsin Central Railroad Property

Soil samples will be collected during installation of monitoring well MW22 adjacent to the river to assess the soil quality off-property to the west and in an attempt to determine the source of the PAH concentrations previously detected in soil (refer to Section 3.6.1.2). Field observation of the fill materials (e.g., presence of coal or cinders) and type of odor (e.g., petroleum, coal tar, or none) will be key to this determination.

6.4.3 Sampling Methods and Abandonment

Subsurface soil samples will be collected using direct-push sampling techniques, as described in Section 4 of the Multi-Site FSP. It is anticipated that one to three subsurface soil samples will be collected from each boring location for analysis of the parameters and associated methods listed on Table 4. Cyanide will be analyzed in a fixed-based laboratory. Other parameters will be analyzed in either an on-site mobile laboratory or a fixed-based laboratory, which may depend on whether the soil sampling is performed congruent with the sediment sampling.

During drilling, soil samples will be collected for field screening to document subsurface conditions and if necessary identify samples for laboratory analysis. Field screening will occur in accordance with the methods and screening techniques identified in the Multi-Site FSP. Visual observations (tar staining) and odors will also be logged and used to identify samples for laboratory analysis. Also, soil samples will be collected to define the vertical extent of contamination from both above and below contaminated layers, as needed, from each boring. If observations or field screening results suggest that the soil is contaminated by a potentially unrelated source, pending any access agreements, at minimum benzene and PAHs will be analyzed for consideration in interpreting future groundwater data. The soil samples will be collected and analyzed in accordance with the methods described in the Multi-Site QAPP and Multi-Site FSP.

Following completion, the soil borings will be abandoned in accordance with the methods described in Section 4 of the Multi-Site FSP.

6.5 Potential Soil Vapor Intrusion Evaluation

Based on the subsurface conditions, the need to further consider the potential for soil vapor intrusion will be evaluated. The following data will be considered:

- Concentrations of COPCs in soil below or anticipated to be below the building floor both near the surface and at depth;
- Presence/absence of coal tar-contaminated soil layers (depth and thickness) below or anticipated to be below the building floor and assessment of the extent and connectedness of the layers;
- Fill material soil type (i.e. fine grained or coarse grained) and quality of any overburden material above coal tar-contaminated soils, if encountered.; and
- Chemical concentrations in samples from groundwater monitoring wells in proximity to the buildings.

Based on the data evaluation, the need for soil vapor sampling will be determined and the decision will be reviewed with USEPA. In general, soil vapor samples will be proposed if available data indicate the potential presence of MGP residuals near or beneath an existing building. If sampling is determined necessary, the soil boring results will be used to determine the soil vapor probe locations and sample depths as outlined in the following sections. Prior to soil vapor probe installation, the sampling locations and depths, along with justification for any proposed deviations, will be reviewed with USEPA. The data evaluation process for the vapor intrusion assessment is provided in Section 1.2 of Appendix F3.

6.5.1 Soil Vapor Sampling Locations

Potential remaining source areas will be characterized prior to initiating any soil vapor sampling. External soil vapor sampling is generally preferred to sub-slab sampling since it is less intrusive to building occupants; however, soil vapor sample locations for vapor intrusion pathway assessment will be based primarily on the locations of the remaining source material and the measured chemical concentrations in groundwater samples from existing wells near each building.

Building construction will also be considered when selecting soil vapor sampling locations; therefore, an attempt will be made to gather construction drawings for the buildings prior to initiating soil vapor sampling in order to have additional information on floor slab and foundation construction. The drawings will be reviewed and the buildings will be inspected to identify potential preferential pathways (i.e. utility corridors, floor drains, sumps, other penetrations) that may exist below the floor slabs or foundations. An assessment will be made as to whether additional vapor sampling locations are warranted within any identified permeable backfill zone. The assessment will consider the permeability of the backfill relative to native soil, depth of utilities, and anticipated distribution of permeable backfill.

6.5.1.1 On-Property Locations

For the on-property building, if source material remains in the subsurface both inside and outside of the building footprint at similar depth, magnitude and concentration, soil vapor sampling probes will be located exterior to the building within approximately 10 feet of the building edge. Exterior proposed locations SV101 through SV106 are shown on Figure 14. If source material substantially remains inside the building footprint only, soil vapor sample locations will be located interior to the building. Interior locations would be near proposed borings SB106 through SB113 (Figure 14). Soil vapor samples will be collected above the water table at two different depths at each location, including approximately 3 and 6 feet below the lowest floor elevation. Depending on the depth at which groundwater is encountered, sample depths may require adjustment such that soil vapor samples are collected from the unsaturated zone. In the case of interior soil vapor probe installation, a sub-slab soil vapor sample will be collected at each location, in addition to the samples collected at approximately 3 and 6 feet below the lowest floor elevation.

6.5.1.2 Off-Property Locations (Winter Property)

For the off-property building (Winter property), because of the physical layout of the gas holder structure and building, any source material present within the holder is expected to remain in the subsurface at similar depth, magnitude and concentration both inside and outside of the building footprint. For this reason, soil vapor sampling probes will be located exterior to the building within approximately 10 feet of the building edge. Proposed locations SV107 through SV109 are shown on Figure 14. Soil vapor samples will be collected above the gas holder base (anticipated to be at 7.5 feet bgs) at two different depths at each location, including approximately 3 and 6 feet below the lowest floor elevation. Depending on the depth at which groundwater is encountered, sample depths may require adjustment such that soil vapor samples are collected from the unsaturated zone.

6.5.2 Sampling Methods and Abandonment

Soil vapor probes are proposed to be installed as semi-permanent probes with flushmount covers such that they can be sampled more than one time in order to assess data validity and temporal/seasonal effects. The probes will be installed in accordance with Multi-Site FSP, Appendix A, SOP No. SAS-11-03 using direct-push techniques. The probe will consist of ¼-inch diameter stainless tubing connected to a ¼-inch diameter, 0.5-ft long stainless steel screen with proper filter pack and bentonite grout seal. For the collection of samples at two different depths at each location, probes will be nested within the same borehole with bentonite placed between the screens/filter packs.

During soil vapor probe installation, samples of the subsurface soil will be collected for grain size analysis, bulk density, specific gravity of soil solids, and moisture content for use in the soil vapor risk assessment.

Active soil vapor sampling will be performed which involves extracting a volume of soil vapor and analyzing the resulting vapor sample. Samples will be collected in 1-L or smaller Summa canisters supplied and certified by the laboratory to ensure cleanliness. Samples will be collected according to the procedures and methods described in the Multi-Site FSP, Appendix A, SOP Nos. SAS-11-04 (probe sampling) and SAS-11-01 (sub-slab sampling) including proper purge volume, sample collection, flow rate and vacuum requirements. Leak detection testing will be conducted using the direct method as described in the above SOPs, including the use of a helium tracer gas and field screening to detect presence of helium in the soil vapor samples. Parameters and methods of analysis for the vapor samples are listed in Table 4. Also, samples will be analyzed for oxygen, carbon dioxide, and methane for vertical profiling to assess bioattenuation. Samples will be analyzed in a fixed-based laboratory as described in Section 6 of the Multi-Site FSP. Probes will be abandoned when no further sampling is deemed necessary.

6.6 Groundwater Evaluation

6.6.1 Existing Well Evaluation

The integrity of existing monitoring wells will be assessed by observing whether the surface seal is cracked, well covers are missing, etc. The Well Condition Field Form will be completed anytime a well is sampled or the water elevation is measured as part of continued groundwater monitoring. Also, the field measurements of total well depth will be compared to the monitoring well logs annually to detect any potential issues with a well. Depending on the results of the well evaluation, a well or wells may be redeveloped, rehabilitated or replaced (consistent with SAS-08-05 of the Multi-Site FSP).

6.6.2 Monitoring Well/Piezometer Installation

Monitoring wells and piezometers are proposed at locations shown on Figure 15 to address the following specific areas of the Site:

1. Three bedrock piezometers located on-property (PZ7B) and within City right-of-way (PZ18TB and PZ23B) to compliment data for proposed wells in the sand unit and define vertical extent;
2. Three groundwater water grab samples from soil borings SB100, SB101, and SB102 adjacent to the Manitowoc River with conversion of one to three locations to permanent piezometers, to evaluate groundwater quality within the sand unit, below the ISS material, discharging to sediment and surface water; and
3. One water table well (MW22) on the Wisconsin Central Railroad Property to monitor groundwater quality off-property to the west and downgradient of the MW14 residual source area and MW-12, and discharging to sediment and surface water.

Details for the installation, decision-making, and sampling of the proposed wells are provided below.

6.6.2.1 Bedrock

The three proposed bedrock piezometers will be located as follows (proposed wells in bold):

- MW7/**PZ7B**, located on-property to the east/southeast of the ISS treatment area;
- MW18T/**PZ18TB**, located in City right-of-way to the south/southeast of the known source area; and
- **PZ23B**, located on City right-of-way Property, within the ISS area and downgradient of the known source area.

As discussed in Section 3, groundwater flow within the dolomite is likely toward Lake Michigan (east), or perhaps very locally toward the river (northwest).

The bedrock surface is expected to be encountered between 50 to 60 feet below ground surface (anticipated elevation of 535 to 545 feet), based on previous borings which apparently "tagged" the surface of the bedrock and also based on well logs of former industrial wells in the area. If drilling continues to 90 feet bgs without encountering bedrock but rather a thick glacial till layer is present exhibiting no evidence of MGP-impacts, the piezometers will be screened within the most permeable interval (based on visual observation) encountered in the till.

The piezometers are anticipated to be drilled approximately 10 feet into competent bedrock. Piezometer screens will have a 5-foot length, with the screen base set at least 10 feet below the top of bedrock. The piezometers are proposed to be drilled by sonic methods, in addition to wireline rotary drilling to collect bedrock core samples. Cores are not able to be obtained using sonic methods. Drilling and well construction activities will be completed in accordance with the methods described in Section 4 of the Multi-Site FSP. Piezometers will be constructed of 2-inch diameter polyvinyl chloride (PVC) material with a 0.01 inch screen slot size. The filter pack will extend two feet above the top of screen and 0.5 feet below the bottom of the screen. A fine sand filter pack seal will then be placed to 2-feet above the filter pack sand.

During drilling, soil samples will be collected to log lithology, determine existence of coal tar contamination, and for field screening to document subsurface conditions and if necessary identify samples for laboratory analysis. Once bedrock is encountered, wireline rotary drilling methods will be used to obtain bedrock cores for field inspection and logging of the rock quality designation (RQD) as specified in the additional SOP included in Appendix F4. Once the competent bedrock cores are collected, the hole will be overdrilled using the sonic method to provide a large enough diameter for installation of the piezometer.

The proposed piezometers were not located in known source areas due to avoid "dragdown" of the MGP contaminants during drilling. If contamination is encountered during drilling in the unlithified zone, sonic drilling allows a larger diameter temporary casing to be set into a confining layer (such as the till) while drilling proceeds into the bedrock. The temporary casing is then removed during the grouting operation.

6.6.2.2 City Property

Three soil borings (SB100, SB101 and SB102) will be performed on the City Property/right-of-way adjacent to the river to collect groundwater grab samples. The purpose of the proposed groundwater sampling at all three locations is to assess groundwater quality and the potential for remaining source in the sand unit below the ISS material. The groundwater grab samples will be collected in the sand unit just above the till layer (if present) with a temporary screen. The grab samples will be analyzed with an on-site mobile laboratory for PVOCs and PAHs to aid in determining the permanent piezometer location(s). At minimum, a piezometer will be installed at one of the three locations (i.e., for the scenario of low to non-detectable concentrations at all three locations). A second and possibly third piezometer will be installed at the two remaining locations based on field observations and/or mobile laboratory data that indicate multiple locations of MGP impacts, or the need to define the lateral extent of groundwater impacts discovered at any of the locations. The grab samples indicating elevated concentrations above the WAC NR 140 ES will be preferred locations. The need to define the eastern and western lateral extent of groundwater impacts at this depth (if appropriate) will also be considered. Piezometer(s) will be screened in the sand unit just above the till layer (if present) with a 5-foot screen. Piezometers will be labeled starting with PZ23, as appropriate for the location. Piezometers will be constructed of 2-inch diameter polyvinyl chloride (PVC) material with a 0.01 inch screen slot size. The filter pack will extend two feet above the top of screen and 0.5 feet below the bottom of the screen. A fine sand filter pack seal will then be placed to 2-feet above the filter pack sand.

Because of their location within the ISS treated material, sonic drilling will be used to install the soil borings. The sonic method will advance through the "hardened" ISS material, providing an indication of drill cutting material; however, no high quality cores of the ISS material will be collected.

6.6.2.3 Wisconsin Central Railroad Property

The proposed water table well (MW22) will provide better definition of the lateral extent of MGP residuals in shallow groundwater to the west. Well MW22 will be screened as a water table well with a 10-foot screen. The well will be constructed of 2-inch diameter polyvinyl chloride (PVC) material with a 0.01 inch screen slot size. The filter pack will extend two feet above the top of screen and 0.5 feet below the bottom of the screen. A fine sand filter pack seal will then be placed to 2-feet above the filter pack sand. The monitoring well is proposed to be drilled by sonic methods. Drilling and well construction activities will be completed in accordance with the methods described in Section 4 of the Multi-Site FSP.

6.6.3 Groundwater Monitoring Well Development

The new monitoring wells and piezometers will be developed in accordance with the methods described in Section 4 of the Multi-Site FSP following installation. Development will continue until the field parameters (pH, temperature, conductivity, etc.) stabilize and at least 10 well volumes of water have been removed from the well (based on the generally sandy subsurface conditions). Further, an additional volume of water equal to the amount added will be removed from the well should it have been necessary to introduce liquids into the well to assist with drilling and/or well construction. Purge water from well development and well sampling activities is anticipated to be sampled and disposed of through the permit that is in place with the City of Manitowoc waste water treatment plant.

6.6.4 Groundwater Level Measurements

Groundwater levels will be measured to assess the elevation and direction of groundwater flow whenever the monitoring wells and piezometers are sampled, or as needed to assess flow conditions. Water level measurements will be collected from all the monitoring wells and piezometers regardless of whether or not a particular location is being sampled. Water levels in wells without product will be measured with an electronic water level indicator as indicated in Multi-Site FSP, Appendix A, SOP No. SAS-08-01. The well(s) with DNAPL product (i.e. MW-14) will first use an electronic water level indicator for water level measurement followed by a clear, bottom-filling bailer to measure product thickness (SOP No. SAS-08-01). Observations and measurements regarding the presence of MGP-residuals within a well will be recorded on the appropriate forms on which the water level measurements will be recorded.

6.6.5 Sampling Schedule and Parameters

Continued groundwater sampling will be completed for the following reasons.

- To detect changes in environmental conditions (e.g., hydrogeologic, chemical, or other changes) that may result in an increased risk or exposure potential;
- To identify any potentially toxic and/or mobile transformation products;
- To assess plume stability and groundwater concentration trends;
- To verify no unacceptable impact to downgradient receptors; and
- To detect new releases of contaminants to the environment that could impact potential remedial action alternatives (e.g., Monitored Natural Attenuation (MNA), institutional controls, etc.).

Groundwater monitoring will be initiated on a quarterly basis following the new monitoring well/piezometer installations such that enough data is collected from the new wells and piezometers before beginning the RI Report. Wells were sampled for the full list of VOCs in May 2005; results of this sampling are provided in Appendix G1. As indicated previously, PVOCs will be sampled in future rounds. The table below indicates which wells and parameters will be sampled during each quarter with notes on the rationale for the well sampling.

	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Existing Wells				
MW1, MW2, MW5, MW7, MW8, MW10, MW12, MW12D, MW13, MW17T,MW18T, MW19T, MW20T, MW21T	PVOCs, PAHs, metals, cyanide	PVOCs, PAHs, Note 1 - metals, cyanide		
MW6	Water Level only			
MW9	PVOCs, PAHs, metals, cyanide	Note 2		
MW14	Water/Product Level only			
MW15T,MW16T	Water Level only	Note 3		
Staff Gauge	Water Level only			
PW1	Water Level only			
Proposed Wells				
MW22	PVOCs, PAHs, metals, cyanide	PVOCs, PAHs, Note 1 - metals, cyanide		
PZ7B, PZ18TB, PZ23B	PVOCs, PAHs, metals, cyanide	PVOCs, PAHs, Note 1 - metals, cyanide		
New Piezometers Along River	PVOCs, PAHs, metals, cyanide	PVOCs, PAHs, Note 1 - metals, cyanide		

Notes:

(1) If concentrations from first quarterly round for metals (aluminum, iron, manganese and vanadium) and available cyanide (OIA-1677) are below screening levels, these parameters will be discontinued from further analysis.

(2) If concentrations from first quarterly round indicate MW7 and MW9 have similar groundwater quality, MW9 (located only 40 ft from MW7) will be discontinued from further sampling. Water level only to be measured at MW9.

(3) If groundwater concentrations at MW22 (on Wisconsin Central Railroad property) are above screening levels during the first quarterly round, wells MW15T and MW16T will be sampled in the subsequent rounds to define the western extent of contamination.

Following quarterly RI sampling for one year, the groundwater monitoring schedule will revert back to annual sampling. If monitored natural attenuation is considered as a remedial option for groundwater, more than one year of quarterly data may be needed. The RI Report will be prepared after two quarterly rounds of groundwater data is collected, with later data added as a supplement. The estimated schedule for the well installations and quarterly sampling is shown on Figure 16. Groundwater samples will be collected for analysis of the parameters and associated methods listed on Table 4. Samples will be analyzed in a fixed-based laboratory as described in the Multi-Site QAPP and FSP. Groundwater sampling will be completed using bailer sampling methods (as previously performed) described in Section 4 of the Multi-Site FSP, to maintain consistency with previous sampling data. Additionally, USEPA sample identification protocol and sampling forms will be used to ensure that samples are tracked accordingly, and that the laboratory analytical data is provided in a manner consistent with the USEPA database requirements. Field parameters will also be recorded including pH, temperature, dissolved oxygen, oxidation/reduction potential, and conductivity.

6.6.6 Aquifer Characterization

Single well aquifer tests will be completed to characterize hydraulic conductivity at the new monitoring well locations only if the drilling observations indicate that the formation is different from the majority of the wells previously installed. Therefore, if the subsurface materials encountered at each well location(s) are comprised primarily of fine to medium grained sand, no testing will be done. No aquifer tests will be performed at the bedrock piezometers. If appropriate, single well tests will be completed in accordance with the methods described in Section 4 of the Multi-Site FSP.

6.6.7 Groundwater Monitoring Well Abandonment

If it is determined that any of the wells or piezometers in the monitoring network require abandonment, the agencies will be conferred with to determine the need for a well replacement in that location. These activities will be completed in accordance with the methods described in Section 4 of the Multi-Site FSP. At this time, no well abandonment activities are planned.

6.6.8 On-Going System Operation, Maintenance and Monitoring and Future Groundwater Monitoring

System operation, maintenance and monitoring (OM&M) and site groundwater monitoring (as described above) will continue during RI/FS work, including influent/effluent sampling on a semi-annual basis and between carbon unit samples on a bimonthly basis (to evaluate when the carbon units require change-out) as indicated in the table below. Prior treatment system analytical results are provided in Appendix G2. Routine operation and maintenance of the system will continue to be conducted on a weekly basis including completing the operations log and changing filter bags as needed. Annual reports of the system OM&M and site groundwater monitoring will be completed.

Treatment System Sampling	
Influent	VOCs, PAHs - Semi-annually in May and November
Intermediate (Between Carbon)	BTEX – Bimonthly
Effluent	VOCs, SVOCs, pH - Semi-annually in May and November

After completing the fourth quarter of groundwater sampling, monitoring will revert back to annual sampling with potential modifications to the groundwater monitoring well network and parameter list. The revised groundwater monitoring schedule will be maintained for the time period between which the RI Report is submitted to the time the RI Report is approved.

The RI Report will provide a plan for continued groundwater monitoring between the timeframe of performing the RI and remedial action. If monitored natural attenuation is considered as a remedial option for groundwater, more than one year of quarterly data may be needed. Identification of and the need for continuing site activities will be discussed with USEPA representatives following completion of the RI work and report.

6.7 Manitowoc River Assessment

6.7.1 Site Morphology

A benchmark (585.33 feet above MSL) is located on the sheet pile wall (Figure 2) at the interface of the Manitowoc River. The depth to river water level will be recorded during each groundwater monitoring event to assess the interaction of the river with groundwater.

Measurements will be obtained in the field to calculate flow velocities and discharge of the river as water enters the turning basin, as water passes through the turning basin, and as water exits the turning basin (Sheet 2). Those sampling locations will correspond with the surface water sampling transects identified in Section 6.7.4. Information available from the United States Geological Survey (USGS) gauging station 04085427 located on the Manitowoc River approximately five miles upstream of the Site will be used in conjunction with field data to assess trends in flow volumes and discharge velocities. This gauging station can only provide relative flow information in the vicinity of the Site due to the separation distance between the gauging station and Site, and other inputs to flow from point and non-point sources. In addition, current and historical river bathymetry measurements collected by the USACE will be obtained and compared to each other to identify areas of erosion and deposition within the river channel. The turning basin is actively being used by commercial ships.

6.7.2 Bathymetric Survey, Side-Scan Sonar, and Sub-Bottom Profiling

Prior to collecting any sediment samples, river bathymetry and stratigraphy will be evaluated using single-beam or multi-beam sonar, side-scan sonar and sub-bottom profiling. A subcontractor will be used to perform the bathymetric survey, side-scan sonar and sub-bottom profiling. The subcontractor will be identified to USEPA prior to initiating field activities in accordance with the AOC/SOW and the subcontractor's SOPs will be submitted to USEPA for review and approval.

Results of the bathymetric survey, side-scan sonar and sub-bottom profiling will be presented in the RI Report.

6.7.2.1 Bathymetric Survey

Prior to collecting any sediment samples, river bathymetry will be evaluated using single-beam or multi-beam sonar. The results from the sonar survey will provide a comprehensive assessment of the river geometry and water depths which will be used to establish a baseline condition, measure river flow velocities and hydrologic characteristics, and provide data for use in the FS. The data collected will also be used with stream flow measurements (velocity measurements, staff gauge measurements, and historic stream flow data from USGS gauging station 04085427) to calculate flow velocities and discharge for this segment of the river, as discussed in Section 6.7.4.

The bathymetry transects will be spaced appropriately to cover the river from bank to bank and extend a distance of approximately 1,200 river feet downstream, corresponding to a portion of the river that widens just downstream of the Wisconsin Central Railroad bridge, and extend a distance of approximately 1,200 river feet upstream which is beyond the upstream end of the turning basin (Sheet 2). Additional bathymetric transects may be added in the field at the direction of the RI Leader.

6.7.2.2 Side-Scan Sonar

Following the bathymetric survey, a side-scan sonar survey will be performed. The results from the side-scan sonar will provide a three-dimensional picture of the bottom of the river at a resolution fine enough to identify debris (e.g., bricks and wood timbers). Results will be used to determine areas where the river bottom is irregular and to assist in identifying debris or other man-made materials present on the river bed, which may be used to refine sediment coring locations. In addition, the side-scan sonar may provide information on the location of the underwater utilities that may need to be considered during the FS.

The side-scan sonar will cover the same area of the river as the bathymetric survey (Sheet 2). Additional side-scan sonar transects may be added in the field at the direction of the RI Leader.

6.7.2.3 Sub-Bottom Profiling

Sub-bottom profiling will be used to further identify the lateral extent of sediment types identified by the cores/borings and provide a high-resolution image of the subsurface stratigraphy. The data will provide information regarding the vertical extent of the soft sediment transition to hard sediment horizon in the subsurface. The sub-bottom profiles will be completed moving parallel to the shoreline.

The sub-bottom profile survey will be conducted concurrently with the side-scan sonar survey. Therefore, the same survey line spacing will be implemented for sub-bottom profiling as described above for side-scan sonar.

The sub-bottom profile data will be processed and interpreted to graphically represent the sediment horizon. Longitudinal profiles will be generated and incorporated in the project database with the bathymetric and side-scan sonar datasets. These data will be used to assist in identifying the lateral and vertical requirements for sediment sampling and assist in remedial design.

6.7.3 Sediment Poling

Sediment poling using an aluminum pole, as described in Section 4 of the Multi-Site FSP will be used to measure the river water depth (i.e. depth to river bottom) and thickness of soft sediment. The elevation of the river will be surveyed from a known benchmark, and this will serve as the reference for both the depth measurements for later conversion to elevations. These results will be correlated with the results of the bathymetric survey, side-scan sonar survey, and sub-bottom profiling. It will also be used to assist with identifying sediment sampling locations. In addition, sediment poling results will be used to refine volume estimates for use in the FS. Sediment poling will be conducted at every sediment and surface water sampling location along the transects illustrated on Sheets 2 and 3. Poling locations will be determined using a differential global position system (DGPS) unit that is accurate to ±1 meter in accordance with the methods described in Section 7 of the Multi-Site FSP.

The results of the sediment poling locations will be compared to the results of the bathymetric survey, sub-bottom profiling, and the NRT 2003 poling data. Discrepancies, if present, may be confirmed with additional sediment poling. However, the minimum distance between poling transects will be 100-feet, unless otherwise determined by the RI or Field Team Leader, based on field conditions. Based on previous sediment poling and analytical results, the sediment poling density may be increased adjacent to the former MGP facility to evaluate the volume of soft sediment present in areas that may be identified with elevated concentrations of MGP-residuals.

The thickness of soft sediment will be recorded on field forms as discussed in Section 4 of the FSP. If sediment is observed on the tip of the pole, the observations (e.g., presence of clay, sand, evidence of tar) will be recorded. If debris is present on the surface of the sediment, there is typically a distinguishable sound when the aluminum pole hits debris, rather than soft sediment. If debris is suspected, additional poling may be performed in the immediate vicinity (5-foot radius or less) to evaluate the differences in the top of soft sediment. The presence of debris will also be noted on the field forms.

6.7.4 Surface Water Sampling

One, and possibly two, surface water sampling events within the Manitowoc River will be performed. The first surface water sampling event will assess the surface water quality in the proximity of the former MGP. The first sampling event is targeted to be performed during warmer weather when volatiles and semi-volatiles would be expected to be released and if possible, during the Step I sediment sampling event (Section 6.7.5) and/or concurrent with a groundwater monitoring event. Surface water samples from the river will be collected with the pump and tubing method as discussed in Section 4 of the Multi-Site FSP.

Three transects will be established for the first surface water sampling event. There will be three sampling locations on each transect; at one-quarter, at one-half, and at three-quarters of the distance across the river. One discrete sub-sample will be collected from each transect location, at 0.8 times the total water column depth at a particular location; totaling 9 water sub-samples to be collected from the river. Surface water sampling locations will fall on transects that will also be used for the bulk chemistry portion of the investigation. Each transect sub-sample location will be identified by the suffix A, B, or C, as samples are collected from the east bank toward the west bank of the river. The three transects will extended perpendicular from the shore to the opposite shore and will be established in the following areas (Sheet 2):

- Transect TSW-1, located upstream of the former MGP property and just upstream of the turning basin (potential ambient sample locations);
- Transect TSW-2, located on the southern end of the sheet pile wall and centered on the area of MGP impacted sediments; and
- Transect TSW-3, located at the downstream end of the turning basin just north of the Wisconsin Central Railroad bridge (potential ambient sample locations).

A second surface water sampling event may be performed, pending the analytical results of the first sampling event. If COPCs are detected above the screening levels provided in the Multi-Site RAF, additional sampling may be performed to assess surface water quality in localized areas above and downstream of affected sediment to evaluate if affected sediments are impacting surface water quality. The surface water sampling locations for the second sampling event, if performed, will be selected based on field conditions (i.e., COPC concentrations, presence of MGP-residuals in sediment, etc.). Sample locations and rationale will be reviewed with USEPA prior to performing the second surface water sampling event.

A peristaltic pump and flow-through cell will be used to collect the surface water samples and determine field characteristics, including pH, temperature, dissolved oxygen, oxidation/reduction potential, conductivity, and turbidity. Sediment poling with an aluminum pole as described in Section 4 of the Multi-Site FSP will be used to measure the total water column depth and estimate soft-sediment thickness at each location. Based on the historic sediment sampling results, surface water samples will be analyzed for the full list of COPCs and total suspended solids (Table 4) in accordance with the Multi-Site QAPP.

River velocity measurements will be made concurrent with the surface water sampling. The river velocity measurements will be collected as described in Section 4 of the Multi-Site FSP at each surface water sub-sample location (Sheet 2). A velocity meter attached to a ridged steel rod will be used to record river velocity from the sampling boat. After the sampling location has been poled to verify depth to top of sediment, the velocity meter will be lowered to into the water column. For water depths of 2.5 feet or less, a velocity measurement will be made at 0.6 times the total water column depth. The velocity measurements at locations where the water column is greater than 2.5 feet will be recorded at 0.2 and 0.8 times the total water column depth. At each depth, the velocity meter will be rotated around until the maximum velocity is recorded on the display. The minimum and maximum velocity at each depth and each location will be recorded on field logs to evaluate the differences in water velocities with depth and for use in the FS.

A qualitative assessment of water quality within the turning basin will be performed to provide information regarding the influences that boat traffic has on sediment stability and water quality. This assessment pertains to large lake freighters/barges, not small recreational craft. Anecdotal information to date suggests that some large boats come close to the former MGP when they turn around in the basin. The City of Manitowoc harbor master will be contacted for their views in this assessment, and also to obtain information about the types, frequency, and scheduling of the large boat traffic. During RI activities, field personnel will visually observe the water clarity immediately before, during, and for a short period after a boat's trafficking within the turning basin to characterize the changes in water clarity as a result of the boat. A goal is to assess up to five large boats. The qualitative assessment will be performed from land rather than from a boat due to safety concerns of being in the turning basin with large boats.

Sampling and measurement locations will be recorded using a DGPS unit that is accurate to ±1 meter in accordance with the methods described in Section 7 of the Multi-Site FSP.

6.7.5 River Sediment Sampling

Sediment sampling will be conducted in two steps. Step I sampling will be conducted to collect samples to be subject to toxicity testing and to calculate a site-specific risk value based on results of ecological risk and human health risk assessments. Step II sampling will identify zones of risk based on sediment concentration and the nature of soft sediments and consolidated parent materials that exceed the calculated site-specific risk value and source (i.e., tar) areas. Representative sediment samples for geotechnical and waste disposal characterization will also be collected in Step II. The sampling events will employ different sampling techniques and will have separate analytical parameters, based on the results of Step I, it is anticipated Step II COPCs will be refined.

The investigation will include surface water samples, soft sediment samples, and parent material samples (consolidated soils that underlie the soft sediment). Surface water and soft sediment samples will be collected upstream, adjacent to, and downstream of the former MGP facility as discussed in Section 6.7.4 and shown on Sheets 2 and 3. Prior investigations suggest that MGP-impacted parent material is limited to portions of the river adjacent to the former MGP facility; as such, sampling of the parent material will be limited to the area in and around the MGP-impacted sediments illustrated on Sheet 3. Table 4 of the Work Plan provides the analytical summary with analytical methods, quantity of samples, container type, sample volume, preservation, and holding times from sample date.

Horizontal control will utilize a DGPS and the boat will be properly anchored to maintain position as described in Section 7 of the Multi-Site FSP. Locations will be recorded as latitude/longitude and later converted to the Wisconsin State Plane - North datum. Vertical control will be established relative to the benchmark established on Site (NAVD88).

6.7.5.1 Step I Sediment Sampling

Ecological Risk Assessment

A minimum of 23 samples soft sediment samples (Sheet 2) will be collected adjacent to the former MGP facility to provide samples with a range of PAH concentrations (see table below) to support the SLERA. The intent is not to limit the SLERA to the near-surface biologically active zone, but rather to evaluate risk correlations to different ranges of PAH concentrations regardless of depth. Samples will be collected generally within the areas previously characterized, with a goal of obtaining several samples in each of four total PAH concentration ranges described below. It is very likely that more than 23 samples will be necessary to obtain the required number of samples in each of the PAH concentration ranges. Since the exact number of samples and concentration distribution will be determined in the field, these additional sample locations (beyond the minimum 23) have not been plotted on Sheet 2. The samples will be collected in and around the area of MGP-impacted sediments illustrated on Sheet 2 and the final locations will be recorded using a DGPS unit as described in Section 7 of the Multi-Site FSP.

A Ponar® grab sampler will be used as described in Section 4 of the Multi-Site FSP to collect soft sediment samples at select locations within the areas previously characterized. The depth to the top of soft sediment and the thickness of soft sediment measured by poling techniques will be recorded prior to using the Ponar® grab sampler. Sufficient sediment volume will be collected (estimated to require three to five grabs) and homogenized in a stainless steel bowl to allow for chemical analysis (mobile laboratory or fixed-based laboratory), physical analysis, and sediment toxicity testing. Samples for PVOCs will not be homogenized to minimize volatilization. Each of these sub-samples will be collected using a stainless steel spoon. If the surficial sediment samples do not provide the range of PAH concentrations required, samples of the subsurface soft sediment (e.g., 0 to 2 feet) may be collected using direct push or vibrocore methods described in Section 4 of the Multi-Site FSP.

All samples will be initially analyzed using an on-site mobile laboratory to identify samples with concentrations representing a range of total PAH concentrations. Optimally, the samples will be evenly distributed in the following ranges:

Sample Quantity	**Total PAHs (ppm)**
3	Ambient Reference Locations
5	10-90
10	100-900
5	1,000 +

Initial PAH sample results may be used with an average TOC concentration (from previous analytical results) to evaluate whether the PAH concentrations summarized above provide an appropriate range of predicted toxicity using the USEPA's equilibrium partitioning sediment benchmark (ESB) approach.

Reference (ambient) locations will be selected from areas:

- A reasonable distance(s) upstream of the former MGP site;
- Where soft sediment has a similar texture to impacted soft sediment; and
- Where soft sediment has a similar depositional environment to impacted soft sediment.

Sediment samples with total PAH concentrations that are not within these ranges listed above, or samples with total PAH concentrations in a range that has already met the optimum sample quantity, will be handled as investigative waste material and a new sample location will be evaluated. All sediment samples will be stored on ice during the mobile laboratory analysis.

Total PAH concentrations within these ranges will be distributed to the extent possible in order to evaluate a broad range of sediment toxicity; however, the distribution may be modified based on field encountered conditions (i.e., range of concentrations) and initial estimates of expected toxicity using the ESB approach. Based on the predicted toxicity and the site-specific concentrations detected, the above distribution may be modified. For example, if the ambient reference locations are greater than 10 ppm total PAHs, the distribution or sample quantity may be shifted. The concentrations of the selected samples for toxicity testing will be reviewed with USEPA prior to performing toxicity testing.

Samples will be further analyzed for COPCs (as identified in Section 3.7), ammonia, and sulfide as described in the Multi-Site QAPP and in accordance with the methods listed in Table 4 to evaluate potential confounding effects. COPCs will be compared to the screening levels of the Multi-Site RAF to evaluate the need for additional assessment. If necessary, the samples selected for toxicity testing may be adjusted to include elevated BTEX concentrations. Sediment samples will also be analyzed for black carbon (aka "soot" carbon), based on the procedural definition of soot as the remaining carbon after muffle furnace drying and acid treatment of sediments to remove other forms of carbon (Gustaffson *et al.* 1997, Accardi-Dey and Gschwend, 2003). The ecological risk assessment analytical data package will be fully data validatable.

A portion of each of the 23 samples selected for further analysis will also be sent to a toxicity laboratory for testing using a modified version of the procedures described by EPA/600/R-99/064 Methods for Measuring the Toxicity and Bioaccumulation of Sediment-Associated Contaminants with Freshwater

Invertebrates, Second Edition; Method 100.4. The test endpoints will be a 28-day survival and growth (weight and length) test using *Hyalella azteca* (amphipod) to evaluate the toxicity of whole sediments. Each set of whole sediment toxicity tests will be conducted with an uncontaminated control sediment and a minimum of 8 replications of each sediment sample.

Human Health Risk Assessment

Human Health screening levels have not been established in the RAF and will be developed (based on site-specific conditions) for the Manitowoc Site and presented in the Risk Assessment section of the RI report. Based on preliminary review of potential exposure assessments, the human health receptors are not anticipated to drive screening level decisions. Ecological screening levels are generally lower than the human health screening levels and will be assumed as the basis for defining risk zones within this SSWP.

A minimum of 3 samples will be collected for the human health risk assessment. Soft sediment samples will be collected adjacent to and slightly downstream of the former MGP facility, generally within the areas previously investigated based upon areas where there is a high probability of direct contact to MGP residuals in the sediments due to recreational activities (i.e., wading or swimming in river, fishing, etc). Based on field reconnaissance, there is no evidence (i.e. pathways to the river) to indicate that people are wading in the river. As previously discussed, the river drops off abruptly approximately 5-feet from the shore, the river is known to be over 20 feet deep in places within 50 feet of shore, and the sheet pile wall and railing prevents people from wading into the water along much of the shore line adjacent to the former MGP facility.

The depth to the top of soft sediment and the thickness of soft sediment will be recorded on field logs prior to sample collection. Samples will be collected from 0 to 2 feet below the top of sediment (the assumed depth to which a person would sink to, wading across the river) in locations that meet the following criteria:

- Areas in which MGP residuals (tar and sheen) have been observed;
- Areas with shallow water depths;

- Areas of the river accessible from land (i.e., boat dock areas);
- Areas of the river in which site conditions indicate people may access the river; and
- An Ogeechee™ open barrel corer or other drive-push sampler will be manually pushed or driven to 2 feet below mudline as described in Section 4 of the Multi-Site FSP. The sediment will be homogenized over the entire core length in a stainless steel bowl using a stainless steel spoon. The sediment will be analyzed in the mobile laboratory for the parameters identified in Table 4.

Samples will be analyzed as described in the Multi-Site QAPP and in accordance with the methods listed in Table 4. Samples for PVOCs will not be homogenized to minimize volatilization. The analytical data package will be fully data validatable.

If the analytical results indicate the interval concentration is greater than the screening value presented in the Step I of the Multi-Site RAF or if field observations during the RI activities indicate an access point to the river, additional borings may be collected. However, the analytical results generated as part of the ecological risk assessment will also be used to assess potential human health risk.

Site Specific Risk and COCs

The results of Step I sampling will be used to calculate a site-specific risk value based on ecological risk and human health risk assessments, and to assist delineation of the source area of sediment contamination. This information will be used to reduce the list of COPCs into a list of COCs and assist in sample location for Step II. The COC list will be developed from COPCs that cause risk to human health or the environment at such levels that a response action will be considered.

6.7.5.2 Step II Sediment Sampling

Sediment coring will be conducted to further characterize sediment concentrations and the nature of soft sediment and parent material exceeding the calculated site-specific risk value (delineate risk zones) and further refine grossly affected sediment areas. Characterization will include definition of degree and extent of contaminated sediment, evaluation of geotechnical properties of sediment, and analytical testing for waste disposal. All sampling activities will be cleared with Digger's Hotline to mark submerged utility structures, cables, and pipelines, if any.

Sediment and parent material samples will be collected as described below using a spud barge and vibrocore, hollow-stem auger drill rig, sonic drill rig, or direct push sampling unit as described in Section 4 of the Multi-Site FSP. The specific drilling methods will be identified to USEPA prior to contracting. The drilling method selected will consider core recovery, core disturbance, contractor availability, and contractor costs. The subcontractor will be identified to USEPA prior to initiating field activities in accordance with the AOC/SOW and the qualifications will be submitted to USEPA for review and approval. If applicable, subcontractor SOPs may also be submitted at this time.

Sampling locations will be recorded using a DGPS unit as described in Section 7 of the Multi-Site FSP.

Sediment cores will be continuously sampled, visually characterized, logged and sub-sampled in accordance with Section 4 of the Multi-Site FSP. The sediment core will be subdivided into the following intervals:

- 0 to 6 inches below mudline (river bottom)
- 6 to 18 inches below mudline
- 18 to 30 inches below mudline
- 30 to 42 inches below mudline
- 42 to 54 inches below mudline, etc.

The 0 to 6 inch below mudline interval will be collected to assess the current concentrations the benthic community is exposed to. The core will be subdivided in one-foot intervals to the bottom of the core. If the last interval is less than 4 inches in thickness, it will be added to the previous interval or analyzed as a separate interval. Each interval will be homogenized in a stainless steel bowl using a stainless steel spoon. Upon completion of sediment borings, non-dedicated sampling equipment will be decontaminated as described in Section 8 of the Multi-Site FSP.

Samples will be analyzed to further characterize sediment concentrations of the chemicals of concern (COCs) identified in the risk assessments (Step I). The list of COCs will be reviewed with USEPA prior to initiation of Step II. Table 4 provides the analytical summary of the full list of COPCs from which the COCs will be determined. The analytical data packages will be fully validated by an independent third party data validator.

Cores which exhibit visible or olfactory evidence of tar or significant sheen in all intervals may not be analyzed, as these cores will be considered affected by MGP residuals, and thus require evaluation during the FS. Each interval in cores without visual or olfactory evidence of tar or significant sheen will be analyzed for COCs to characterize concentrations in sediment. Additional cores may be advanced between sampling locations and transects to refine the area considered in the FS. Data from cores and the site-specific risk values will be used in the FS to establish areas for which remedial alternatives will be developed.

Sampling Transects

Step II sampling will occur along nine sampling transects labeled TS2-1 through TS2-9 (Sheet 3). Initial sediment transects and locations may be adjusted based on the findings of Step I. The initial sediment transects/locations will be reviewed with USEPA prior to initiating Step II sampling.

The proposed initial locations of the transects are based on relative location to MGP impacted sediments as observed from previously performed investigations. Sediment sampling will be bounded approximately 700 river feet at the channel center upstream and approximately 900 river feet at the channel center downstream of the MGP property by transects TS2-1 and TS2-9 respectively. Transects TS2-4, TS2-5, and TS2-6 are located approximately one quarter, one half, and three quarters of the length of the source area. Location of the sediment sampling transects relative to source area has been summarized below:

- TS2-1: Upstream limit of sampling (approximately 700 river feet at the channel center upstream), provides narrow channel velocity measurements, and potential ambient measurements of soft sediment and surface water.
- TS2-2: Fills data gap between upstream limit and upstream edge of source area transects (TS2-1 and TS2-3), provides soft sediment samples.
- TS2-3: Upstream edge of source area, provides soft sediment and parent material samples.
- TS2-4: Upstream portion of source area (approximately ¼ length of source area), provides source area soft sediment and parent material samples, potential waste characterization samples.

- TS2-5: Central portion of source area (approximately ½ length of source area), provides turning basin channel velocity measurements, source area soft sediment, parent material, and surface water samples.

- TS2-6: Downstream portion of source area (approximately ¾ length of source area), provides source area soft sediment and parent material samples, potential waste characterization samples.

- TS2-7: Downstream edge of source area provides soft sediment and parent material samples.

- TS2-8: Fills data gap between downstream limit and downstream edge of source area transects (TS2-7 and TS2-9), soft sediment samples.

- TS2-9: Downstream limit of sampling (approximately 900 river feet at the channel center downstream), provides downstream channel velocity measurements, and potential ambient measurements of soft sediment and surface water.

MGP-impacted sediments identified in previous investigations are located between the USACE navigation channel and the shore of the former MGP facility (Sheet 3). Therefore, sediment sampling locations are more dense between the USACE navigation channel and the east shore along each transect (i.e., sediment sampling is weighted towards the bench sediments near the former MGP facility).

Sampling along each transect will start from the east shore moving towards the west shore. A minimum spacing of 50 feet will be maintained between sampling locations starting on the east side of the river (east bench). Wherever possible, more than one sampling location will be placed within the east bench river sediments. After collection of the east bench samples, one channel sample will be collected 100 feet from the last east bench sample along the transect. On most transects, one sample will also be collected from the west bench sediments to evaluate the other side of the channel. All transects except TS2-4, TS2-5, and TS2-6 include samples collected from the west bench and the navigation channel. Initial transect sediment samples are summarized on Sheet 3.

Additional sediment transects or sampling locations may be added on an iterative approach to refine the area/volume of sediment above the site-specific risk values, background "ambient" concentrations, or other screening values (i.e., PEC, etc.) from the Multi-Site RAF used to define the zones of acceptable versus unacceptable risk. The approach to extrapolating (i.e., kriging, inverse distance weighting, straight interpolation, etc.) between these data points will be discussed with USEPA as part of the RI Report scoping meeting.

Soft Sediment Samples

The soft sediment samples will be collected along transects (Sheet 3) discussed above using a vibrocore sampler or equivalent to refusal (i.e., top of consolidated parent material) as described in Section 4 of the Multi-Site FSP. The vibrocore sampler is electrically powered to advance a core tube with a dedicated liner up to 20 feet into soft sediment. After selecting the subcontractor, the operating procedure may be modified. The number and location of the soft sediment samples may be adjusted in response to Step I source area delineation.

Historical data has shown that core recoveries are as low as 60 percent; however, technology for collecting core samples has advanced to the point where 90 percent recovery should be expected for most sample types. To prevent precluding any emergent technologies, a performance-based specification will be written in the request for proposal to potential sampling subcontractors. The specifications that will be required include:

- Ability to attain and maintain station position: use of spuds is preferred over anchoring;
- Station location: less than 3 feet (approximately 1 meter) (x, y) using DGPS in latitude/longitude degrees, minutes, and seconds and later converted to Wisconsin State Plane – North datum;
- Depth measurement with water level correction: less than 0.1 feet (approximately 3 centimeters (cm)) (z) referenced to NAVD88; water elevation to be surveyed at least once per day (i.e., mid-day) for determining core sample elevation;
- Coring equipment: vibrocore or equivalent;
- Recovery/penetration: greater than 90 percent (this is a goal, not a minimum requirement);
- Ability to document rate of penetration; and
- Ability to collect core samples down to parent material (potentially 1 to 10 feet).

Parent Material Samples

Previous investigations identified MGP impacts and coal tar in the consolidated (between 5 to 50+ blows per foot) sand, silt, and clay parent material. These impacts were documented within 50 feet of shore along the east bank of the river from the north end of the sheet pile wall approximately 400 feet downstream (within the area of observed coal tar impacted sediment on Sheet 3). Impacts in the parent material were documented at depths from 0 to 13 feet below river bottom.

Samples of the parent material will be collected along transects (Sheet 3) discussed above with either hollow stem auger or sonic drilling rigs as described in Section 4 of the Multi-Site FSP. Collection of parent material samples will be limited to transects that are inside or adjacent-to the area of observed coal tar impacted sediment (Sheet 3). Parent material cores will be continuously sampled and advanced approximately 20 feet below river bottom, or until 4 consecutive feet of un-impacted material is encountered (determined by field the geologist visually and using Photo ionization detector (PID)). Cores will be subdivided into 2-foot sections, instead of 1-foot sections, for analysis of COCs. The number and location of parent material cores may be adjusted in response to Step I source area delineation.

Additional Elements for Evaluating Ecological Risk

A benthic community structure assessment may be performed if elevated concentrations of PAHs are widely detected in the surface sediment (0-6 inches below mudline). Ideally, the benthic community assessment would be performed at locations selected for toxicity testing. If toxicity testing samples are collected below the biologically active zone (BAZ), the benthic community assessment would not provide meaningful data.

If field conditions indicate otherwise, benthic community structure assessments may be performed concurrently with warm weather surface water sampling activities, to evaluate:

- The abundance and diversity of bottom-dwelling species;
- Evaluate the overall ecological integrity of the river; and
- Assist with defining background or "ambient" conditions.

Prior to performing a benthic community assessment, the RI Leader, Project Manager, Project Coordinator, and Remedial Project Manager will discuss appropriate assessment locations and approach to distinguish the potentially confounding effects of boat traffic and/or dredging versus COPC concentrations in sediment.

If benthic community structure assessment is performed, a field biologist will assess the benthic community structure, as described in Section 4 of the Multi-Site FSP using sediment samples collected from a grab sampler. The benthic community structure assessment samples will be co-located along sediment and surface water transects and, if possible, next to toxicity testing sample locations. Benthic community assessment locations may be adjusted in the field.

Grab samples will be collected from a reference location, considered as the background or "ambient" location (as described in Section 6.7.5.2), two mid-point transects, and the downstream-most transect within a range of observed total PAH concentration, similar to the distribution to select toxicity samples. Up to three sample locations may be located on each transect based on the total PAH concentration, whether a toxicity testing sample was collected at the location, or the presence of soft sediment identified in the sediment poling (Section 6.7.3). Four replicate samples will be collected from each sample location.

The sediment will be collected from the top of the mudline to six inches below the mudline, generally considered the BAZ for burrowing and feeding in freshwater benthic organisms. Multiple grab samples may be necessary to collect a representative sample of sediment. Field logs will note locations where soft sediment was collected using DGPS as described in Section 7 of the Multi-Site FSP.

Evaluating Residual Upwelling

As discussed in the Manitowoc Completion Report, surface water samples were collected by WDNR in an attempt to evaluate the presence of MGP residuals in sheens observed on the surface water adjacent to the former MGP. Thereafter, between November 2003 and July 2004, the presence of oil sheens was periodically documented at five different locations along the Manitowoc River. Based on these observations, it appears the oil sheens may be related to the presence of MGP-residuals within the sediment.

To assist with evaluating the occurrence of sheens from upwelling caused by gas ebullition, up to ten clear plastic cores will be collected in areas where sheens have been previously observed and where sediment is not grossly affected with MGP residuals (based on visual observations made during Step II Sediment Sampling). It is anticipated that areas with grossly impacted sediment are more likely to be removed and therefore understanding the mechanisms of residual upwelling in these areas is not as relevant. Areas with less affected sediment will be evaluated for a larger range of remedial actions and the mechanisms of residual upwelling will need to be considered to understand potential risks and appropriately design and evaluate remedial alternatives.

The cores will be qualitatively inspected for visual evidence of coal tar, gas bubbles, and sheen within the sediment matrix. Observations will be recorded on the field logs. The cores will be brought back to NRT's warehouse to further observe over time the cores through the clear tubes for potential changes in the presence/absence of sheen as well as gas bubbles.

Step II Sediment Sample Summary

In summary, 32 COC transect sampling locations are proposed for Step II. These may be modified based on results obtained in Step I and from near real-time results obtained in the field during Step II. Each sampling location could have an average of 5 soft sediment samples submitted for analysis (160 soft sediment COC analyses). Eight of those locations are proposed to include parent material sampling which may have 10 samples per boring submitted for analysis (80 parent material COC analyses). To address Quality Assurance/Quality Control (QA/QC), blind duplicate and matrix spike/matrix spike duplicate (MS/MSD) samples will be collected as described in Section 3.0 of the QAPP.

6.7.5.3 Geotechnical and Waste (WDNR Chapter 347) Sampling

In addition to the cores for analytical testing, approximately 20% of the cores (approximately 7 core locations) will include sample volume for analysis of geotechnical parameters for use in the FS. These parameters include: Atterberg Limits, grain-size, specific gravity, organic content by loss-on-ignition, and moisture content. Field measurements to estimate shear strength may be collected using a pocket penetrometer and/or a torvane (using a large vane for soft soils) as described in Section 4 of the Multi-Site FSP.

Geotechnical samples will be collected from distinct layers of soft sediment and parent material and may be discrete intervals, or composite samples, depending on the conditions observed. Three core samples will be collected at the same location as the NR 347 samples (Sheet 3) discussed below. The geotechnical samples will be collected from 7 different core locations as summarized below:

- Four core locations will only analyze soft sediment (1 sample each core location);
- Three core locations will analyze soft sediment and parent material (approximately 3 samples per core location);
- The three core locations that analyze both soft sediment and parent material will be collected from the same core locations and the same layers as the NR 347 samples described below; and
- At least 3 samples will be collected from each distinct unit near the source area (e.g. soft sediment, parent material sand, parent material silt and clay).

The final number of geotechnical samples collected may change based on the number of distinct units identified during investigation.

Because dredging of MGP-impacted sediment will likely be included as a remedial alternative to be evaluated in the FS, analytical samples will be collected pursuant to WDNR Chapter 347 "Sediment Sampling and Analysis, Monitoring Protocol and Disposal Criteria for Dredging Projects" (NR 347).

The degree and extent of sediment contamination will be defined through the two step investigation discussed above. In accordance with the substantive requirements of NR 347, three sediment core locations are proposed within and downstream-of the MGP-impacted sediments for the collection of representative waste characterization samples. Two sampling locations will be located within the MGP-impacted sediments identified on Sheet 3, and one sampling location will be located immediately downstream of the MGP-impacted sediments (Sheet 3). Summary of NR 347 sampling:

- Samples will be collected from each distinct layer observed in the material to be dredged;
- If a distinct layer is encountered in more than one boring (very possible), aliquots of that layer from each boring may be composited as described in Multi-Site FSP, Appendix A, SOP No. SAS-06-01 for a representative sample;
- If distinct layers are not present in a boring, the core will be divided into 2-foot segments and each segment will be treated as a distinct layer;

- Where MGP-impacts have been observed beneath the soft sediment, sampling will extend into the parent material beneath;
- Each distinct layer of the soft sediment and parent material will be submitted for the suggested base parameter analyses for Great Lakes waterways (Summarized in Table 4); and
- Each core will extend 2 feet past the deepest observed MGP-impacts in either soft sediment or parent material (i.e. maximum potential dredging depth plus 2-feet). This material may be submitted for analysis to establish residual contaminant levels and physical parameters of residual materials.

A composite sample will also be prepared for waste characterization by collecting and combining the entire core from the three NR 347 borings. The composite sample will be sent to a fixed-based laboratory under chain-of-custody procedures. The sample will be analyzed for Protocol B parameters to identify potential disposal options.

In summary, one sample from each distinct layer within the MGP-impacted material (approximately 4 samples) will be submitted for NR 347 analysis, at least three samples from each distinct layer will be submitted for geotechnical parameters (approximately 12 samples), and one composite will be collected for waste characterization. In addition, each 2-foot sample below the proposed project depth (three samples) may also be submitted for NR 347 and geotechnical analysis.

6.8 Disposal of Investigation-Derived Waste

Investigative wastes will continue to be containerized during Site investigation activities prior to disposal off-site. NRT will ensure that both facilities listed below meet the requirements of the "Off-Site Rule (OSR)" (September 1993, USEPA) for the disposal of investigation-derived waste prior to undertaking any disposal activities. If either of these facilities does not meet the OSR requirements, USEPA will be informed and appropriate facilities will be identified.

During the soil remediation activities, solid wastes were disposed through Waste Management's Ridgeview Landfill. Therefore, soils and sediment wastes generated during well/boring installation and river sampling activities may be disposed at this facility based on the historic use of this Site for solid waste disposal purposes. Because the soil data from the site was collected in the 1990's, the landfill will likely require that new samples be collected. A composite sample of soil and a composite sample of sediment will be prepared for waste characterization by collecting representative soil and sediment in the project area. The composite sample will be sent to a fixed-based analytical laboratory for Protocol B analysis parameters.

Groundwater wastes have been disposed through the City of Manitowoc publicly owned treatment works (POTW). Therefore, groundwater and surface water wastes are anticipated to be disposed through this POTW. All disposal activities will be completed in accordance with applicable state and federal regulations and the methods described in Section 9 of the Multi-Site FSP.

Representative samples for disposal purposes will be obtained and provided as required by the disposal authority through which the wastes will be managed and disposed. The landfill will be contacted prior to sending waste characterization samples to the laboratory to verify the required analysis.

6.9 Record Keeping

Details of field and laboratory records and data management and storage are provided in the Multi-Site QAPP and FSP.

6.10 Sample Analysis and Validation

The on-site mobile, fixed-based, toxicity and geotechnical laboratories will be coordinated and contracted following USEPA written approval of this SSWP. The selected laboratories will be identified to USEPA prior to initiating field activities in accordance with the AOC/SOW and the laboratories SOPs, if not previously submitted or if revised since submittal, will be provided to USEPA for review and approval.

Table 4 summarizes the proposed Sampling and Analysis Plan for the Manitowoc Former MGP and includes samples to satisfy QA/QC requirements in accordance with Section 2 of the Multi-Site QAPP. As described above, the dynamic work plan approach will be used and additional samples (including QA/QC samples) may be collected.

Laboratory procedures, field measurements and sample results will be verified and/or validated as discussed in the Multi-Site QAPP (Section 4).

6.11 Data Evaluation and Tabulation for Risk Assessment

Verified and/or validated data will be entered into NRT's database and tabulated for use as described in the Multi-Site QAPP. Details of the procedures for assessing the precision, accuracy, representativeness, completeness and comparability of field data and analytical laboratory data are described in Section 4 of the Multi-Site QAPP.

The data will be evaluated to assess if the DQOs identified in the Multi-Site QAPP have been met.

Analytical results will be organized in a logical manner such as by sample location number, sample type or sample area. Analytical tables will indicate the unique sample identification number corresponding to the sample/location/well name, sampling date and time, sample depth, detection limits, analytical results (following the units of measurement presented in the Multi-Site QAPP Table 9) and validation qualifiers, if appropriate. Data may be presented in summary tables, graphs, and as plan view and/or cross-sectional views with COPC concentrations, as determined necessary.

Data sets may be created for each medium and may include summary statistics (detection frequency, arithmetic mean concentration, maximum detected concentration, standard deviation, and 95% upper confidence limit of the mean (UCL).

7 REMEDIAL INVESTIGATION REPORT

An RI Report will be prepared at the conclusion of the investigation activities. This report will include the following information and documentation, as appropriate, in accordance with Task 4 of the SOW attached to the Settlement Agreement:

- A description of the field procedures and methods used during the RI;
- A discussion of the nature and rationale for any significant variances from the scope of work described in this RI/FS SSWP;
- The data obtained during the RI and previously collected data considered to be of useable quality. This will include analytical data, field measurements, etc. To the extent practicable, RI and previously collected data will be presented in figures and tabular formats;
- The results of an assessment to evaluate if the RI acceptance/performance criteria, as specified in the Multi-Site QAPP, were met;
- The methods and rationales used in evaluating RI and previously collected data;
- Conclusions regarding extent and nature of MGP residuals in the various media being investigated;
- A revised Site-Specific CSM with a discussion of environmental fate and transport of COPCs;
- Baseline Risk Assessment Report, as discussed in the Multi-Site RAF;
- Discussion of anticipated future land use and reuse assessment; and
- Supporting materials for RI data. These will include boring logs, monitoring well construction diagrams, groundwater sampling logs, laboratory analytical reports, and similar information.

8 FEASIBILITY STUDY SCOPE OF WORK

This section identifies the approach to the FS for the Manitowoc Former MGP Site. The FS will be completed in accordance with the guidelines presented in "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (USEPA, 1988). Additional guidance may be identified as part of future discussions with USEPA during scoping meetings to prepare the Multi-Site FS Memorandum and Documents included in the SOW.

Multi-Site FS Documents to be prepared include:

- Preliminary Remedial Technology Screening (SOW Task 1.2.2.1);
- Preliminary List of Possible ARARs (SOW Task 1.2.2.2); and
- Preliminary Permitting/Equivalency Requirements (SOW Task 1.2.2.3).

8.1 Development and Screening of Alternatives

Task 6 of the SOW requires a range of site-specific remedial alternatives be developed and screened for evaluation in the FS. The site-specific remedial alternatives will build on the Multi-Site FS Documents. A Site-Specific Alternatives Screening Technical Memorandum will be prepared to summarize the site-specific alternative array analysis. The memorandum will document the methods, the rationale and the results of the alternatives screening process and will include the following elements:

8.1.1 Development of Remedial Action Objectives

Remedial action objectives will be developed based on the results of the human health and ecological risk assessments. Prior to developing these objectives, the contaminants and media of concern, potential pathways, and contaminant level or ranges that are protective of human health and environment will be specified. The remedial response objectives that may be developed will focus on eliminating or minimizing substantial risks to human health and the environment.

8.1.2 Identify Areas or Volumes of Media

The areas and/or volumes of media in which response actions may apply will be delineated and will consider the requirements for protectiveness as identified in the RAO. These areas and/or volumes of media addressed will form the foundation for developing and screening remedial technologies.

8.1.3 Identify, Screen, and Document Remedial Technologies

Applicable technologies will be identified and evaluated to eliminate technologies that cannot be implemented at the Site. This screening will be accomplished by evaluating alternatives on the basis of effectiveness, implementability, and cost as described below.

- **Effectiveness Evaluation** – The effectiveness evaluation will consider the capability of each remedial alternative to protect human health and the environment. Each alternative will be evaluated as to the protection it would provide and the reductions in toxicity, mobility or volume of COPCs it would achieve.

- **Implementability Evaluation** – The implementability evaluation will be used to measure both the technical and administrative feasibility of constructing, operating and maintaining a remedial action alternative. In addition, the availability of the technologies involved in a remedial alternative will be considered. Innovative technologies will be considered throughout the screening process if there is a reasonable belief that they offer potential for better treatment performance or implementability, few or lesser adverse impacts than other available approaches, or lower costs than demonstrated technologies.

- **Cost Evaluation** – The cost evaluation will include estimates of capital costs, annual operation and maintenance (O&M) cost, and present worth analyses. These conceptual cost estimates are order-of-magnitude estimates, and will be prepared based on preliminary conceptual engineering for major construction components and unit costs of capital investment and general O&M costs available from USEPA guidance documents or past experience with similar systems/projects.

8.1.4 Assemble and Document Alternatives

A draft remedial alternatives screening memorandum for the FS will be prepared that will document the preliminary FS work tasks described above and will address each affected media or operable unit. A draft memorandum will be submitted to USEPA for review and comment, summarizing the results of the preliminary screening. The list of potential remedial alternatives developed above will initially undergo preliminary screening to reduce the number of technologies and alternatives for future analysis while preserving a range of options, if necessary. In addition, the ARARs associated with each of the assembled alternatives will be summarized.

8.2 Detailed Analysis of Alternatives

Task 7 of the SOW requires a detailed analysis of remedial alternatives be presented to USEPA for use in selecting the Site remedy. This analysis will use the Multi-Site FS documents as the framework.

The remedial alternatives that pass the initial screening will be further evaluated. The detailed evaluation will include an analysis of each remedial option against nine evaluation criteria as set forth in 40 C.F.R. § 300.430(e)(9)(iii). These nine criteria include:

- **Overall Protection of Human Health and the Environment** – Assess whether each remedial alternative meets the remedial action objective that it is protective of human health and the environment. The overall assessment of protection is based on several factors assessed under the evaluation criteria, including long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs.

- **Compliance with ARARs** – Evaluate how each alternative complies with applicable or relevant and appropriate requirements (ARARs) (Federal and State).

- **Long-Term Effectiveness and Permanence** – Assesses the remedial action in terms of the risk remaining at the Site after the response objectives have been met. The assessment focuses on evaluating the extent and effectiveness of the controls that may be required to manage the risk posed by treatment residuals and/or untreated wastes and is based on the magnitude of remaining risk and the adequacy, suitability, and long-term reliability of management controls to provide continued protection from residuals.

- **Reduction of Toxicity, Mobility and Volume through Treatment** – Addresses the preference for selecting remedial actions that include treatment technologies to permanently and significantly reduce toxicity, mobility or volume of contaminants. Factors to be considered include treatment processes selected, the volume of material to be treated/destroyed, the degree of reduction in toxicity, mobility or volume, and the type/quantity of treatment residuals.

- **Short-Term Effectiveness** – Assesses the effects of the alternative during the construction and implementation phase until the remedial actions have been completed and protection is achieved. The assessment considers the effects on the community and on-site workers during the remedial action, environmental impacts during implementation, and the amount of time until protection is achieved.

- **Implementability** – Addresses the technical and administrative feasibility of implementing an alternative and availability of services and materials to implement the remedy. Technical feasibility considers construction, operation, reliability, flexibility for future remedial action (if necessary), and the ability to monitor performance. Administrative feasibility considers coordination with agency groups, permitting, and approvals.

- **Cost** – Addresses the capital costs, annual operation and maintenance (O&M) costs, and present worth analysis. Capital costs include direct (equipment, labor and materials) and indirect (engineering, financial and other services required to complete remedial actions) costs. Annual O&M costs are post-construction costs to ensure the on-going performance of the remedial action. Remedial action cost estimates will be compared using present worth analysis to reflect future expenses in present-day dollars.

- **Agency Acceptance** – Compares the technical and administrative issues and concerns of each alternative presented. Agencies may include USEPA, WDNR, and the State Department of Health.

- **Community Acceptance** – Addresses the community's concerns into the evaluation of remedial alternatives. It is anticipated the focus on community concerns will be on short-term impacts during remedial action and potential reuse scenarios. Community acceptance may be re-evaluated as necessary during public comment on the FS.

8.2.1 Compare Alternatives against Each Other and Document the Comparison of Alternatives

After the remedial alternatives have been assessed against the evaluation criteria, a comparative analysis will be performed. This analysis will compare all of the remedial alternatives against each other for each criterion. USEPA will identify and select the preferred alternative.

8.2.2 Alternatives Analysis for Institutional Controls

Alternatives that rely on institutional controls will be evaluated using the following criteria:

- **Overall Protection of Human Health and the Environment** – Includes specific institutional control components that will ensure the alternative will remain protective and describes how theses specific control will meet remedial action objectives.

- **Compliance with ARARs** – Evaluates how each institutional control complies with applicable or relevant and appropriate Federal and State requirements.

- **Long-Term Effectiveness** – Assesses the adequacy and reliability of institutional controls and how long the institutional control must remain in place.

- **Short-Term Effectiveness** – Assesses the amount of time it will take to impose an institutional control.
- **Implementability** – Includes research and documentation that the proper entities (e.g., potentially responsible parties, state, local government entities, local landowners, conservation organizations) are willing to enter into any necessary agreement or restrict covenant with the proper entities and/or that laws governing the restriction exist or allow implementation of the institutional control.
- **Cost** – Includes the cost to implement, maintain, monitor and enforce the institutional control.
- **State and Community Acceptance** - Addresses the community's concerns into the use of institutional controls. Community acceptance may be re-evaluated as necessary during public comment on the FS.

8.3 FS Report

A Draft FS Report will be prepared to summarize the activities performed and to present the results and associated conclusions for the tasks performed. The report will include a summary of the initial screening study process and present the detailed analysis of remedial alternatives considered as basis for developing a Record of Decision (ROD).

It is anticipated, the FS Report will contain the following sections:

- Introduction and Site Background;
- Development of Remedial Action Objectives and General Response Actions;
- Identification and Screening of Remedial Technologies;
- Development and Initial Screening of Remedial Alternatives;
- Detailed Analysis of Alternatives;
- Comparative Analysis of Alternatives; and
- Summary.

The feasible technology options for Site remediation, if warranted, will be identified for each general response action, and the results of the remedial technologies screening will be described. Remedial alternatives will be developed by combining the technologies identified in the previous screening process. The results of the initial screening of remedial alternatives, with respect to effectiveness, implementability and cost will be described. Final screening against the nine comparative criteria and the comparison of remedial alternatives will be presented with a final recommended remedial alternative. A description of the key requirements for alternative implementation and estimated time frame for construction of the final recommended alternative will also be presented in the summary and conclusions section of the report.

9 SCHEDULE

Figure 16 presents a preliminary project schedule showing the overall progress of the work for the major tasks to be performed in support of the Manitowoc Former MGP RI/FS. Although not included on the schedule, soil vapor sampling and a second round of surface water sampling may be performed pending initial RI results. Due to the seasonally-dependent sampling events, the overall schedule is dependent on USEPA approvals.

The preliminary schedule assumes:

- At least four rounds of groundwater from the proposed groundwater monitoring wells and piezometers are collected,
- Treatability testing is not required and if a treatability study is deemed necessary during the RI, the schedule will be modified when the scope of work is identified; and
- Contractor availability during the time periods needed.

Following approval of the SSWP, a more detailed or revised schedule may be submitted to USEPA with the first monthly progress report, at least 15 days following approval of the SSWP.

10 REFERENCES

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2006 October 31, Natural Resource Technology, Inc., *Operation, Maintenance and Monitoring Status Report, Reporting Period – September 1, 2005 to August 31, 2006, Former Wisconsin Fuel & Light Manufacturing Gas Plant, 402 North Tenth Street, Manitowoc, Wisconsin, USEPA ID# WIN000509949.*

2006 December 4, Natural Resource Technology, Inc., *Completion Report, Former Manufactured Gas Plant, Manitowoc, Wisconsin, USEPA# WIN000509949.*

2007 August, *Generalized Conceptual Site Model*, prepared for Integrys.

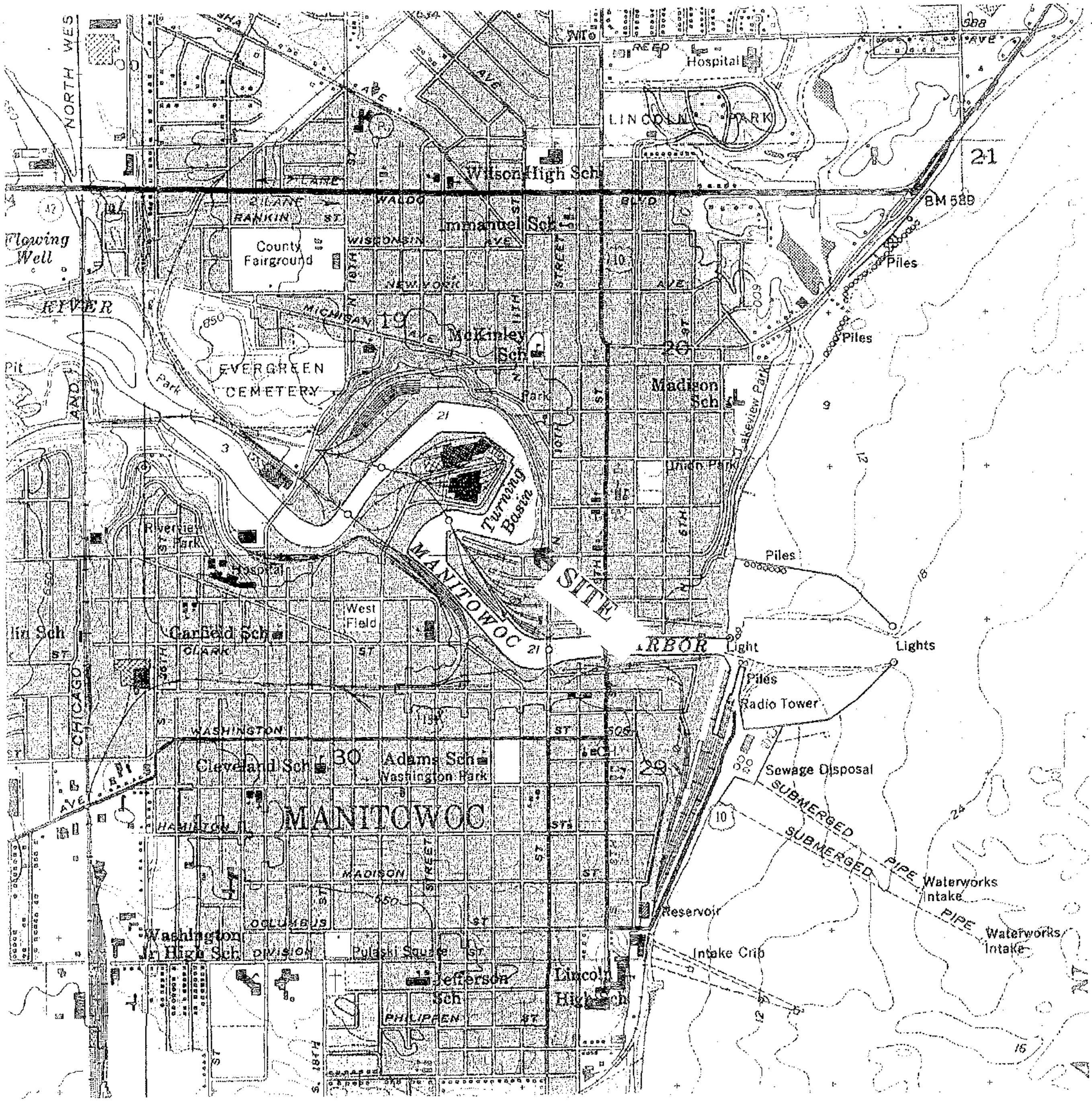
2007 September, Exponent, *Multi-Site Risk Assessment Framework Revision 0, Former Manufactured Gas Plant Sites.*

2007 September *Multi-Site Quality Assurance Project Plan Revision 2,* prepared for Integrys.

2007 August *Multi-Site Health and Safety Plan*, prepared for Integrys.

2008 February, *Multi-Site Field Sampling Plan Revision 3*, prepared for Integrys.

FIGURES



SOURCE: EARTHVISIONS U.S. TERRAIN SERIES,
© EARTHVISIONS, INC. 603-433-8500.
USGS 7.5 MINUTE QUADRANGLE,
MANITOWOC. DATED 1954.
PHOTOREVISED 1973.

QUADRANGLE LOCATION

N

0 2000 4000

SCALE IN FEET

CONTOUR INTERVAL 10 FEET

Natural Resource Technology

N R T

SITE LOCATION

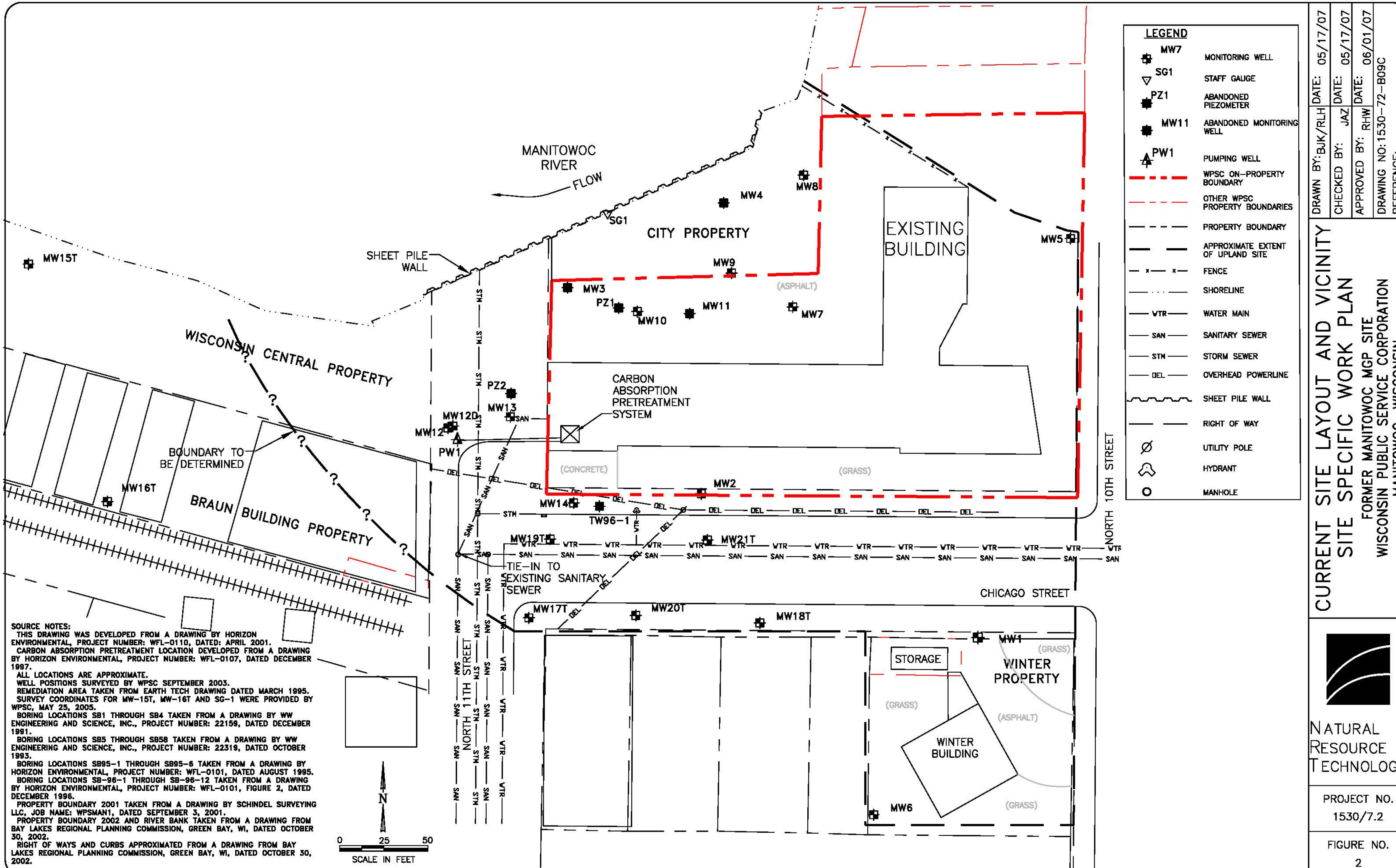
FORMER MANUFACTURED GAS PLANT
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

PROJECT NO. 1530

DRAWING NO. 1530-12-A01

FIGURE NO. 1

DRAWN BY: RLH 7/1/02 APP'D BY: JTB DATE: 7/1/02


LEGEND
MW7 MONITORING WELL
SG1 STAFF GAUGE
PZ1 ABANDONED PIEZOMETER
MW11 ABANDONED MONITORING WELL
PW1 PUMPING WELL
WPSC ON-PROPERTY BOUNDARY
OTHER WPSC PROPERTY BOUNDARIES
PROPERTY BOUNDARY
APPROXIMATE EXTENT OF UPLAND SITE
FENCE
SHORELINE
WATER MAIN
SANITARY SEWER
STORM SEWER
OVERHEAD POWERLINE
SHEET PILE WALL
RIGHT OF WAY
UTILITY POLE
HYDRANT
MANHOLE
MANITOWOC RIVER
FLOW
SHEET PILE WALL
CITY PROPERTY
EXISTING BUILDING
(ASPHALT)
WISCONSIN CENTRAL PROPERTY
BOUNDARY TO BE DETERMINED
BRAUN BUILDING PROPERTY
CARBON ABSORPTION PRETREATMENT SYSTEM
(CONCRETE)
(GRASS)
TIE-IN TO EXISTING SANITARY SEWER
NORTH 10TH STREET
NORTH 11TH STREET
CHICAGO STREET
STORAGE
WINTER PROPERTY
WINTER BUILDING
MW1 MW2 MW3 MW4 MW5 MW6 MW7 MW8 MW9 MW10 MW11 MW12 MW12D MW13 MW14 MW15T MW16T MW17T MW18T MW19T MW20T MW21T TW96-1 PZ1 PZ2 PW1 SG1
SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0110, DATED: APRIL 2001.
CARBON ABSORPTION PRETREATMENT LOCATION DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0107, DATED DECEMBER 1997.
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BORING LOCATIONS SB95-1 THROUGH SB95-6 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, DATED AUGUST 1995.
BORING LOCATIONS SB-96-1 THROUGH SB-96-12 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, FIGURE 2, DATED DECEMBER 1996.
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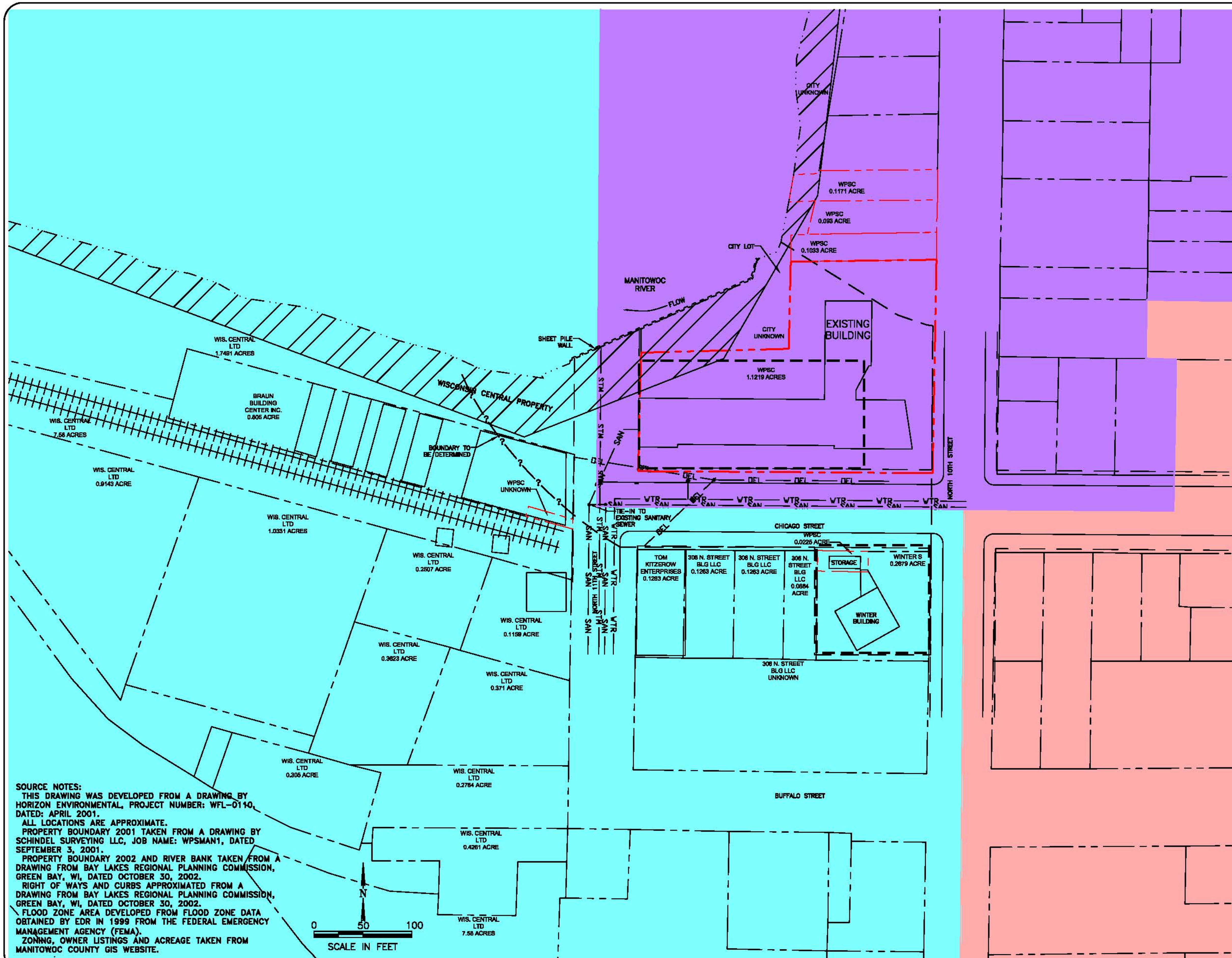
RIGHT OF WAYS AND CURBS APPROXIMATED FROM A DRAWING FROM BAY LAKES REGIONAL PLANNING COMMISSION, GREEN BAY, WI, DATED OCTOBER 30, 2002.
N
0 25 50
SCALE IN FEET
DRAWN BY: BJK/RLH DATE: 05/17/07
CHECKED BY: JAZ DATE: 05/17/07
APPROVED BY: RHW DATE: 06/01/07
DRAWING NO: 1530-72-B09C
REFERENCE: .
CURRENT SITE LAYOUT AND VICINITY
SITE SPECIFIC WORK PLAN
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN
NATURAL RESOURCE TECHNOLOGY
PROJECT NO. 1530/7.2
FIGURE NO. 2



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FLOOD ZONE AREA DEVELOPED FROM FLOOD ZONE DATA OBTAINED BY EDR IN 1999 FROM THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA).
ZONING, OWNER LISTINGS AND ACREAGE TAKEN FROM MANITOWOC COUNTY GIS WEBSITE.

LEGEND

- PROPERTY BOUNDARY
- WPSC ON-PROPERTY BOUNDARY
- OTHER WPSC PROPERTY BOUNDARIES
- SHORELINE
- WTR — WATER MAIN
- SAN — SANITARY SEWER
- STM — STORM SEWER
- DEL — OVERHEAD POWERLINE
- SHEET PILE WALL
- RIGHT OF WAY
- APPROXIMATE EXTENT OF UPLAND SITE
- APPROXIMATE FORMER MGP FACILITY EXTENT
- UTILITY POLE
- HYDRANT
- MANHOLE
- ZONE I-2 INDUSTRIAL (HEAVY)
- ZONE C-1 COMMERCIAL
- ZONE B-3 BUSINESS (GENERAL)
- 100-YEAR FLOOD ZONE (APPROXIMATE)

NOTES:
1. CURRENT PROPERTY OWNER AND ACREAGE LISTED FOR EACH PROPERTY.

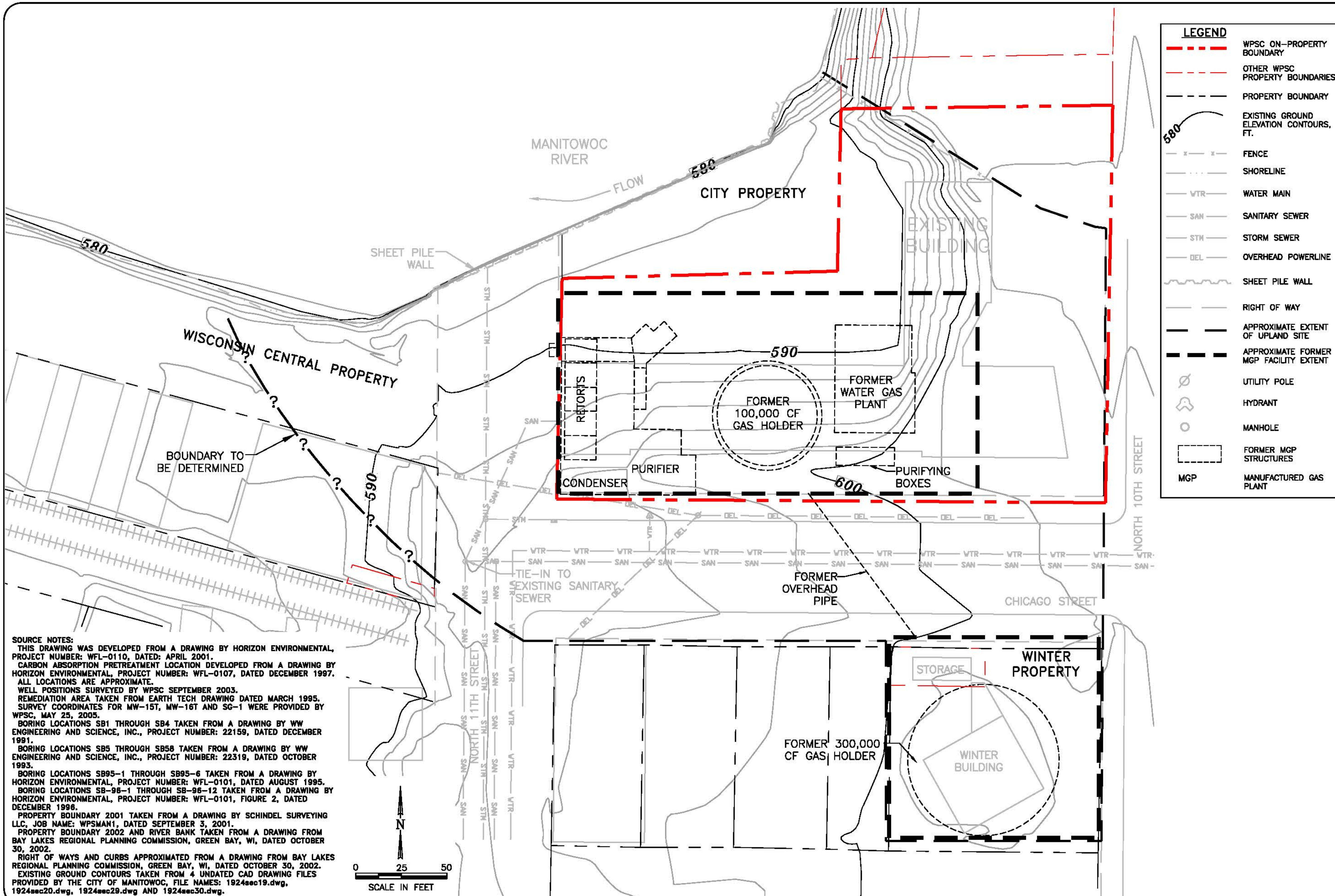
DRAWN BY: BJK/RLH DATE: 05/17/07
CHECKED BY: JAZ DATE: 05/17/07
APPROVED BY: RHW DATE: 06/01/07
DRAWING NO: 1530-72-B10C
REFERENCE: .

CURRENT PROPERTY OWNER AND ZONING INFORMATION
SITE SPECIFIC WORK PLAN
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/7.2

FIGURE NO. 3



SOURCE NOTES:

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CARBON ABSORPTION PRETREATMENT LOCATION DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0107, DATED DECEMBER 1997.

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EXISTING GROUND CONTOURS TAKEN FROM 4 UNDATED CAD DRAWING FILES PROVIDED BY THE CITY OF MANITOWOC, FILE NAMES: 1924sec19.dwg, 1924sec20.dwg, 1924sec29.dwg AND 1924sec30.dwg.

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CHECKED BY: JAZ DATE: 04/02/08
APPROVED BY: JAZ DATE: 04/09/08
DRAWING NO: 1530-72-B011C-01
REFERENCE: .

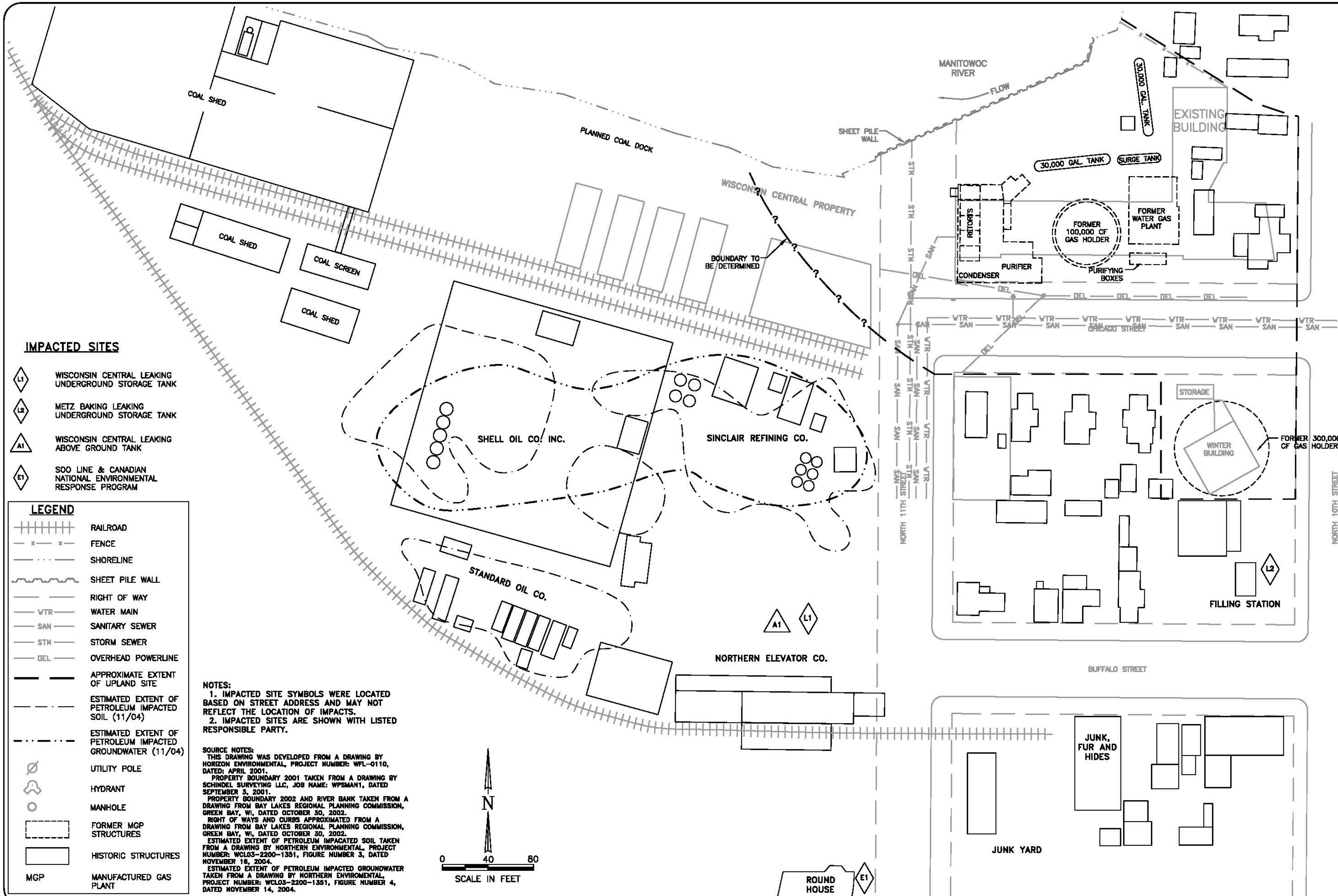
FORMER MGP STRUCTURE LOCATIONS

SITE SPECIFIC WORK PLAN
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/7.2

FIGURE NO. 4



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DRAWING NO: 1530-72-B04-01	
REFERENCE: .	

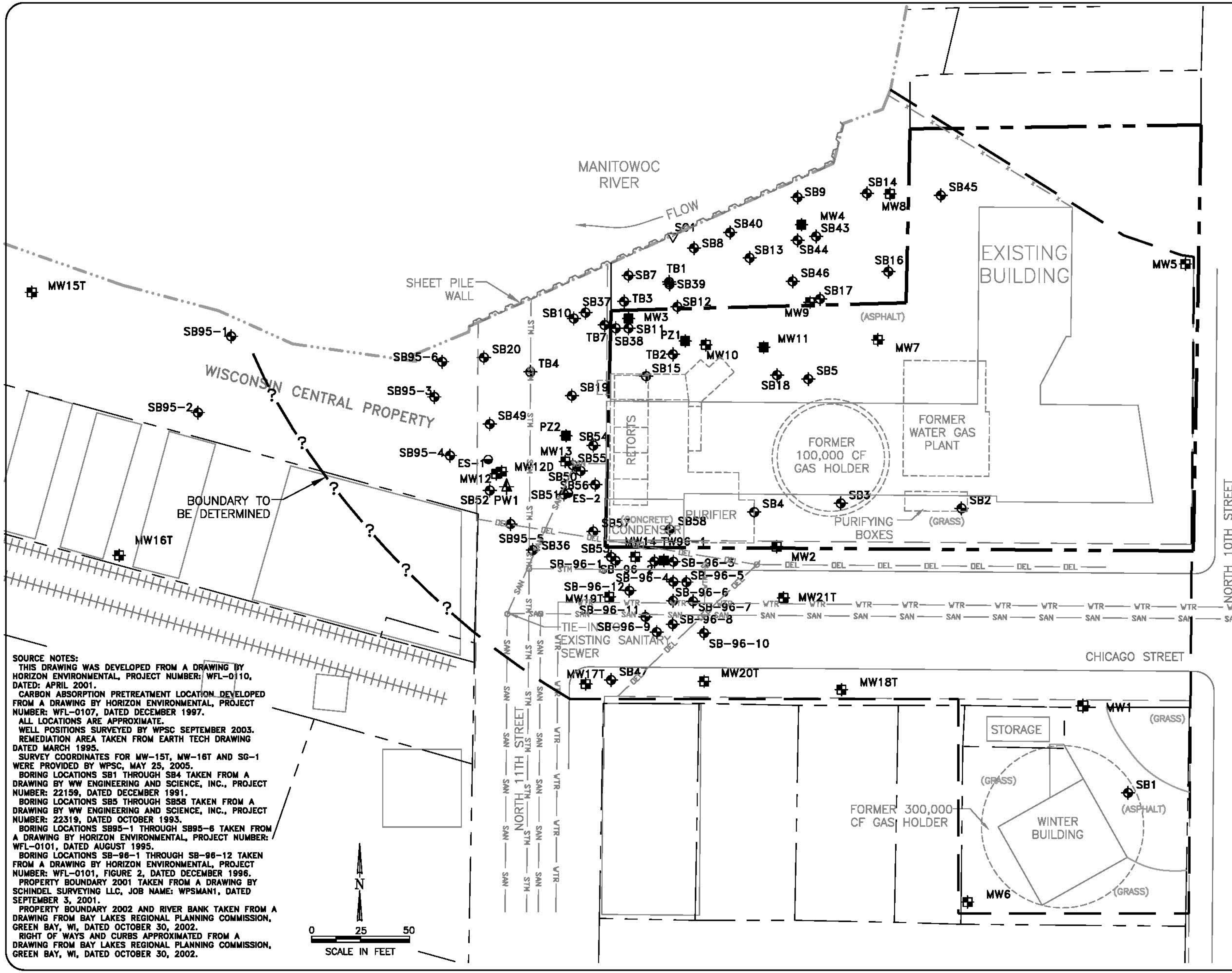
HISTORICAL SITE LAYOUT AND VICINITY

SITE SPECIFIC WORK PLAN
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1530/7.2

FIGURE NO.
5



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LEGEND

MW7	MONITORING WELL
SG1	STAFF GAUGE
PZ1	ABANDONED PIEZOMETER
SB9	SOIL BORING
MW11	ABANDONED MONITORING WELL
ES-1	EXCAVATION SAMPLE
PW1	PUMPING WELL
	WPSC ON-PROPERTY BOUNDARY
	PROPERTY BOUNDARY
	APPROXIMATE EXTENT OF UPLAND SITE
—x—x—	FENCE
	SHORELINE
—WTR—	WATER MAIN
—SAN—	SANITARY SEWER
—STM—	STORM SEWER
—DEL—	OVERHEAD POWERLINE
	SHEET PILE WALL
	RIGHT OF WAY
	UTILITY POLE
	HYDRANT
	MANHOLE
	FORMER MGP STRUCTURES
MGP	MANUFACTURED GAS PLANT

DRAWN BY: BJK/RLH	DATE: 05/17/07
CHECKED BY: JAZ	DATE: 05/17/07
APPROVED BY: RHW	DATE: 06/01/07
DRAWING NO: 1530-72-B12	
REFERENCE: .	

PREVIOUS UPLAND INVESTIGATION SAMPLING LOCATIONS

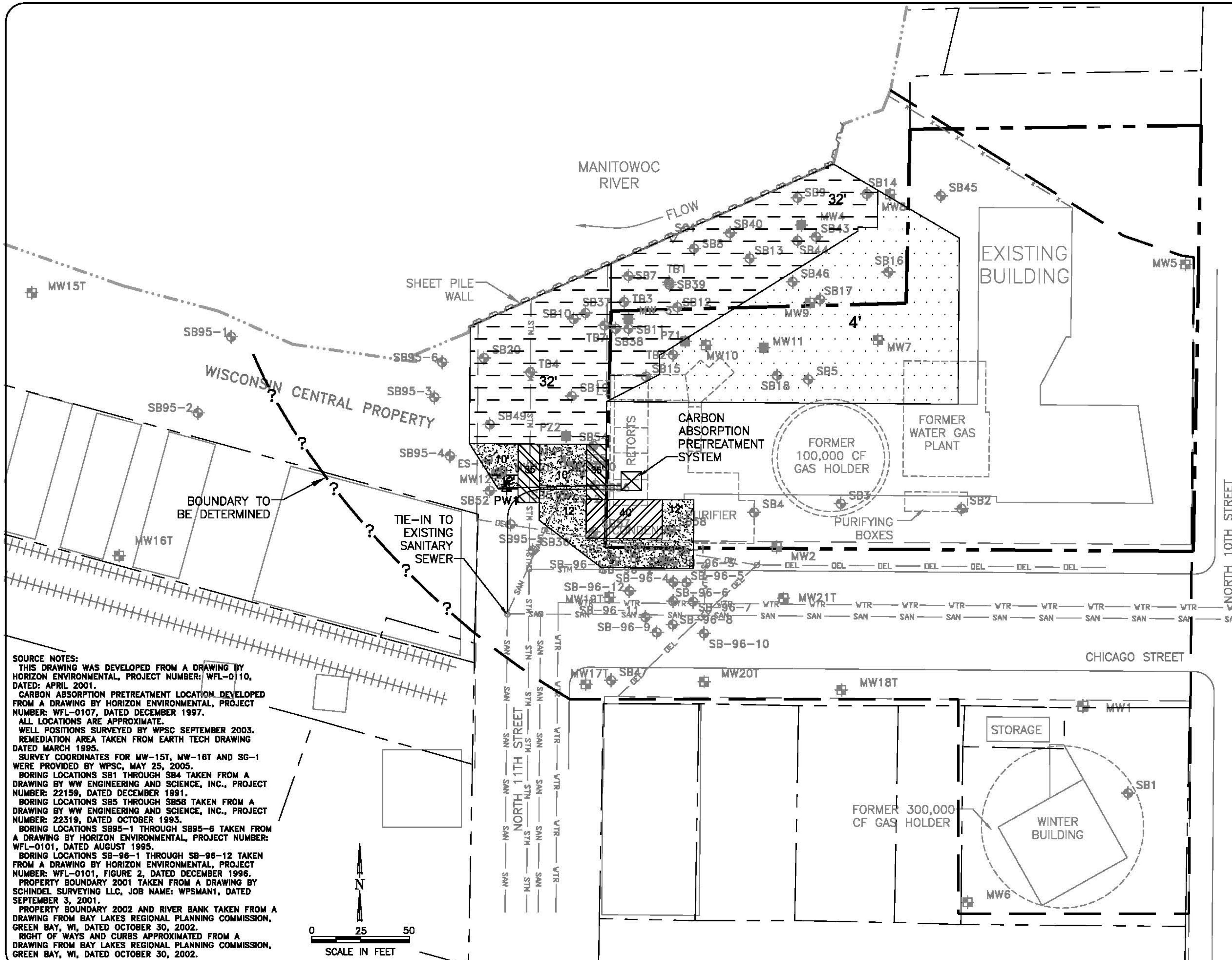
SITE SPECIFIC WORK PLAN

FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1530/7.2

FIGURE NO.
6



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LEGEND

MW7	MONITORING WELL
SG1	STAFF GAUGE
PZ1	ABANDONED PIEZOMETER
SB9	SOIL BORING
MW11	ABANDONED MONITORING WELL
ES-1	EXCAVATION SAMPLE
PW1	PUMPING WELL
	WPSC ON-PROPERTY BOUNDARY
	PROPERTY BOUNDARY
	APPROXIMATE EXTENT OF UPLAND SITE
	FENCE
	SHORELINE
WTR	WATER MAIN
SAN	SANITARY SEWER
STM	STORM SEWER
DEL	OVERHEAD POWERLINE
	SHEET PILE WALL
	RIGHT OF WAY
	UTILITY POLE
	HYDRANT
	MANHOLE
	FORMER MGP STRUCTURES
32'	SOIL STABILIZED TO 32 FEET bgs (1993 AND 1994)
35'	SOIL STABILIZED TO 35 FEET bgs (1993)
40'	SOIL STABILIZED TO 40 FEET bgs (1993)
12'	JANUARY 1994 EXCAVATION AND DEPTH (FT)
4'	OVERBURDEN EXCAVATION AND DEPTH (FT) LIKELY 1994
MGP	MANUFACTURED GAS PLANT

DRAWN BY: BJK/RLH DATE: 05/17/07
CHECKED BY: JAZ DATE: 05/17/07
APPROVED BY: RHW DATE: 06/01/07
DRAWING NO: 1530-72-B13
REFERENCE: .

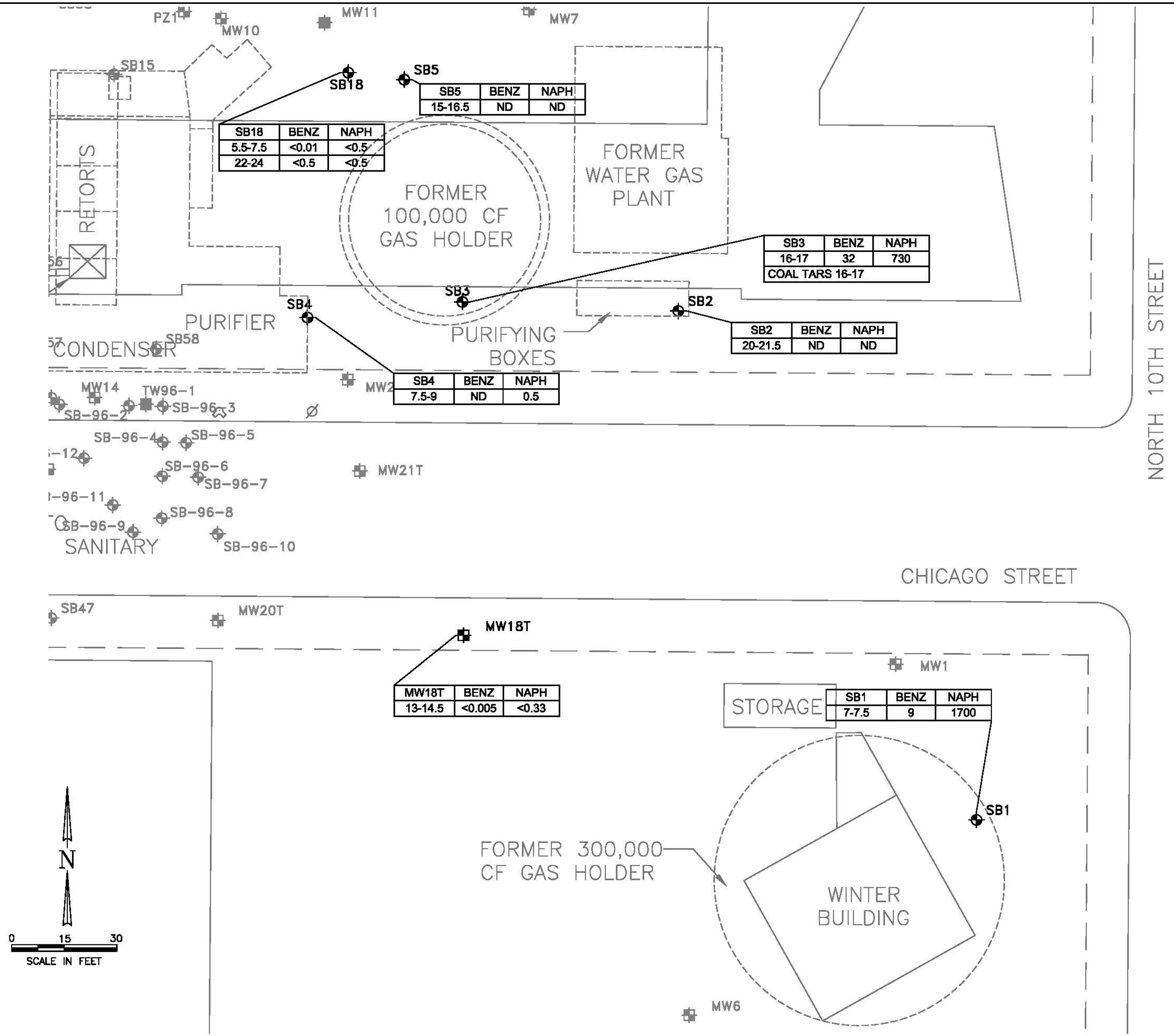
PREVIOUS RESPONSE ACTIONS SITE SPECIFIC WORK PLAN

FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/7.2

FIGURE NO. 7



SB18	BENZ	NAPH
5.5-7.5	<0.01	<0.5
22-24	<0.5	<0.5

SB5	BENZ	NAPH
15-16.5	ND	ND

SB3	BENZ	NAPH
16-17	32	730
COAL TARS 16-17		

SB2	BENZ	NAPH
20-21.5	ND	ND

SB4	BENZ	NAPH
7.5-9	ND	0.5

MW18T	BENZ	NAPH
13-14.5	<0.005	<0.33

SB1	BENZ	NAPH
7-7.5	9	1700

LEGEND

MW7	MONITORING WELL
PZ1	PIEZOMETER
SB9	SOIL BORING
MW11	ABANDONED MONITORING WELL
ES-1	EXCAVATION SAMPLE
PW1	PUMPING WELL
	FORMER MGP STRUCTURES
MGP	MANUFACTURED GAS PLANT
ND	NOT DETECTED

SAMPLE LOCATION	BENZ	NAPH
SAMPLE DEPTH	TOTAL BENZENE mg/kg	TOTAL NAPHTHALENE mg/kg

SOURCE NOTES:
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RIGHT OF WAYS AND CURBS APPROXIMATED FROM A DRAWING FROM BAY LAKES REGIONAL PLANNING COMMISSION, GREEN BAY, WI, DATED OCTOBER 30, 2002.

DRAWN BY: BJK	DATE: 01/11/06
CHECKED BY: JAZ	DATE: 05/17/07
APPROVED BY: RHW	DATE: 06/01/07

DRAWING NO: 1530-72-B05
REFERENCE: 1530 SOIL FIG 8 TBLS 070124

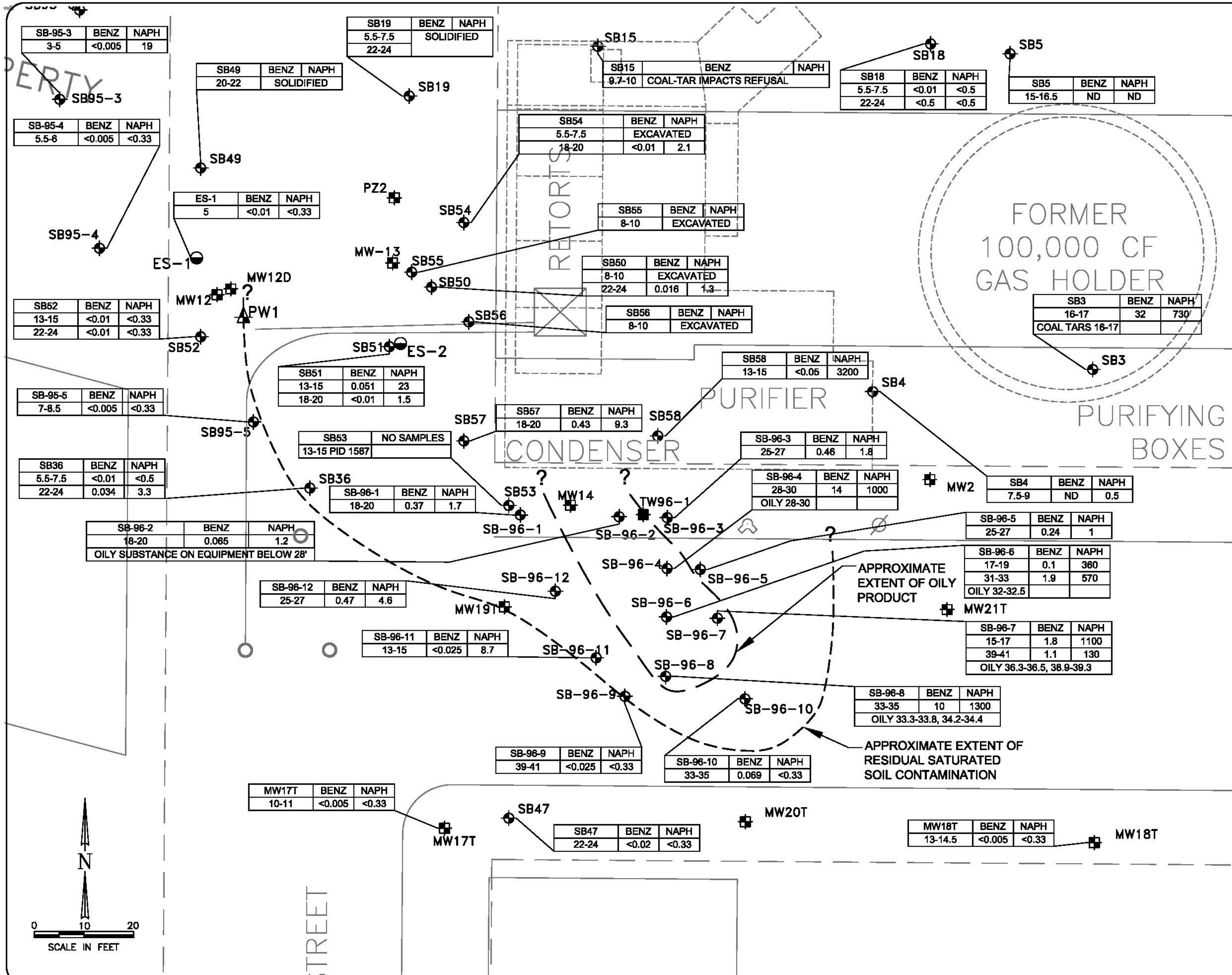
FORMER GAS HOLDER SOIL DATA SITE SPECIFIC WORK PLAN

FORMER WISCONSIN FUEL AND LIGHT COMPANY MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/7.2

FIGURE NO. 8



LEGEND

MW7	MONITORING WELL
PZ1	PIEZOMETER
SB9	SOIL BORING
MW11	ABANDONED MONITORING WELL
ES-1	EXCAVATION SAMPLE
PW1	PUMPING WELL
	FORMER MGP STRUCTURES
MGP	MANUFACTURED GAS PLANT
ND	NOT DETECTED

SAMPLE LOCATION	BENZ	NAPH
SAMPLE DEPTH	TOTAL BENZENE mg/kg	TOTAL NAPHTHALENE mg/kg

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0110, DATED: APRIL 2001.
CARBON ABSORPTION PRETREATMENT LOCATION DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0107, DATED DECEMBER 1997.
ALL LOCATIONS ARE APPROXIMATE.
WELL POSITIONS SURVEYED BY WPSC SEPTEMBER 2003.
REMEDIATION AREA TAKEN FROM EARTH TECH DRAWING DATED MARCH 1995.
SURVEY COORDINATES FOR MW-15T, MW-16T AND SG-1 WERE PROVIDED BY WPSC, MAY 25, 2005.
BORING LOCATIONS SB1 THROUGH SB4 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22159, DATED DECEMBER 1991.
BORING LOCATIONS SB5 THROUGH SB58 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22319, DATED OCTOBER 1993.
BORING LOCATIONS SB95-1 THROUGH SB95-6 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, DATED AUGUST 1995.
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DRAWN BY: BJK/RLH DATE: 05/17/07
CHECKED BY: JAZ DATE: 05/17/07
APPROVED BY: RHW DATE: 06/01/07
DRAWING NO: 1530-72-B02
REFERENCE: 1530 SOIL FIGS TBLS 070124

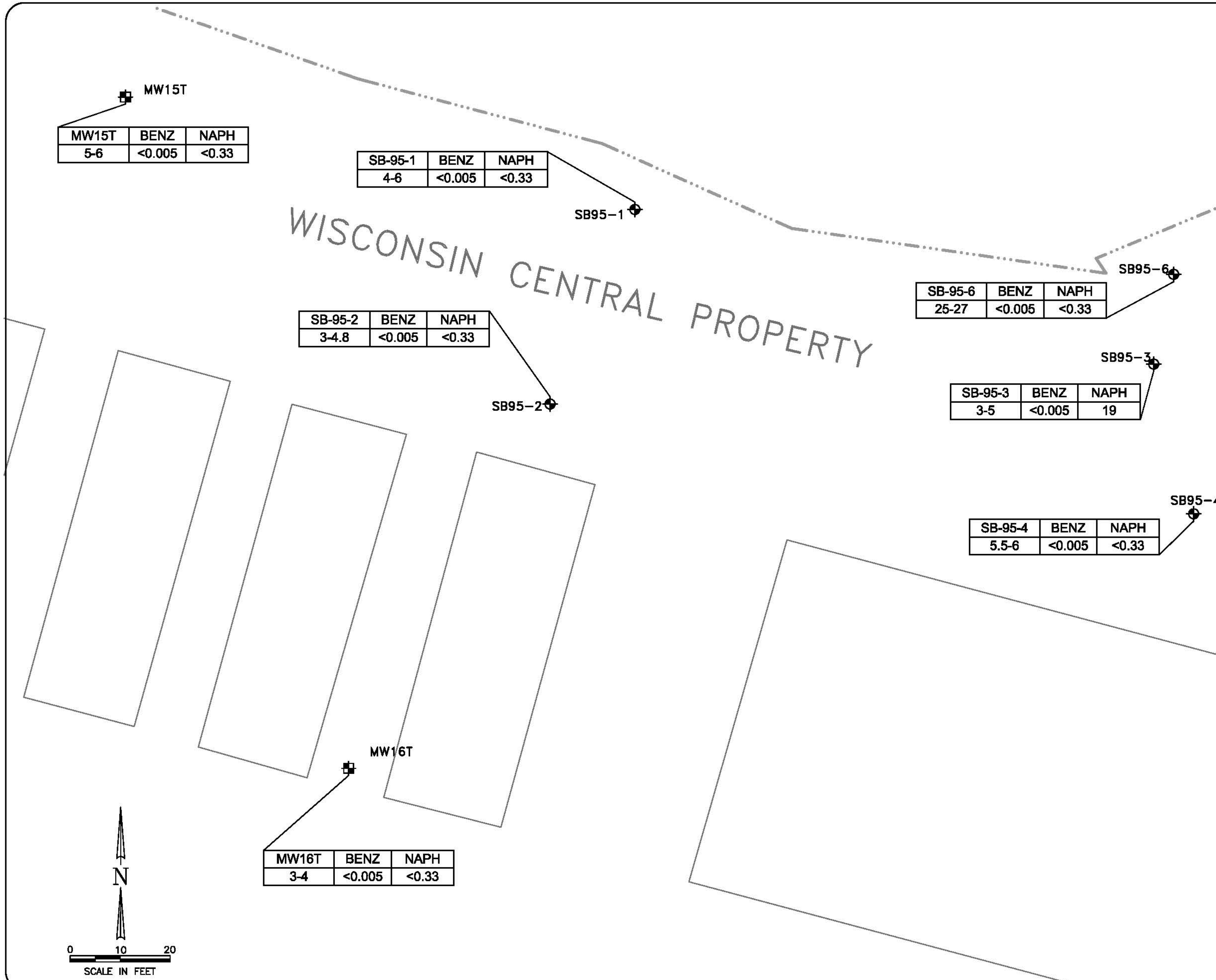
MW14 AREA SOIL DATA AND PRODUCT IN SOIL MATRIX SITE SPECIFIC WORK PLAN

FORMER WISCONSIN FUEL AND LIGHT COMPANY MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/7.2

FIGURE NO. 9



MW15T	BENZ	NAPH
5-6	<0.005	<0.33

SB-95-1	BENZ	NAPH
4-6	<0.005	<0.33

SB-95-2	BENZ	NAPH
3-4.8	<0.005	<0.33

SB-95-6	BENZ	NAPH
25-27	<0.005	<0.33

SB-95-3	BENZ	NAPH
3-5	<0.005	19

SB-95-4	BENZ	NAPH
5.5-6	<0.005	<0.33

MW16T	BENZ	NAPH
3-4	<0.005	<0.33

LEGEND

MW7	MONITORING WELL
PZ1	PIEZOMETER
SB9	SOIL BORING
MW11	ABANDONED MONITORING WELL
ES-1	EXCAVATION SAMPLE
PW1	PUMPING WELL
	SHORELINE
	FORMER MGP STRUCTURES
MGP	MANUFACTURED GAS PLANT

SAMPLE LOCATION	BENZ	NAPH
SAMPLE DEPTH	TOTAL BENZENE mg/kg	TOTAL NAPHTHALENE mg/kg

SOURCE NOTES:
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RIGHT OF WAYS AND CURBS APPROXIMATED FROM A DRAWING RECIEVED FROM BAY LAKES REGIONAL PLANNING COMMISSION, GREEN BAY, WI, DATED OCTOBER 30, 2002.

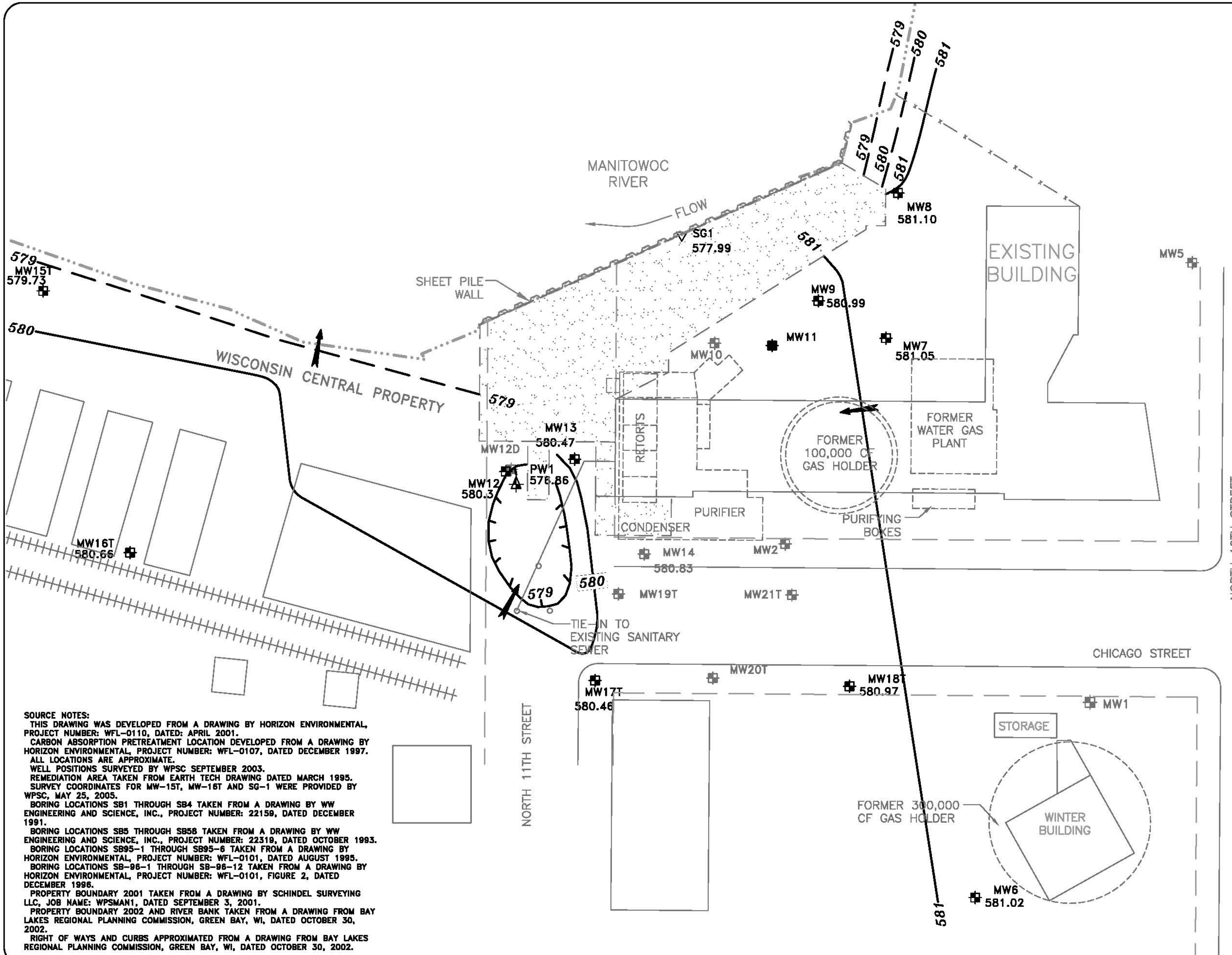
DRAWN BY: BJK DATE: 01/11/06
CHECKED BY: JAZ DATE: 05/17/07
APPROVED BY: RHW DATE: 06/01/07
DRAWING NO: 1530-72-B03
REFERENCE: 1530 SOIL FIG 8 TBLS 070124

WISCONSIN CENTRAL PROPERTY SOIL DATA
SITE SPECIFIC WORK PLAN
FORMER WISCONSIN FUEL AND LIGHT COMPANY MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/7.2

FIGURE NO. 10



LEGEND

580.0	WATER TABLE ELEVATION CONTOURS, FT.
	GROUNDWATER FLOW DIRECTION
MW7 581.74	MONITORING WELL AND GROUNDWATER ELEVATION, FT. (11/28/05)
SG1	STAFF GAUGE AND RIVER ELEVATION, FT.
MW14 580.83	PRODUCT PRESENT, GROUNDWATER ELEVATION APPROXIMATE AND NOT USED IN CONSTRUCTION OF CONTOURS
MW11	ABANDONED MONITORING WELL
MW2	WATER TABLE MONITORING WELL WITH GROUNDWATER ELEVATION ABOVE SCREEN. ELEVATION WAS NOT USED TO DEVELOP SHALLOW GROUNDWATER ELEVATION CONTOURS
PW1	PUMPING WELL AND GROUNDWATER ELEVATION, FT.
	FENCE
	SHORELINE
	FORMER MGP STRUCTURES
	STABILIZED AREA (1993 AND 1994 REMEDIATION)
MGP	MANUFACTURED GAS PLANT

NOTE:
ALL ELEVATIONS ARE REFERENCED TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929.

SOURCE NOTES:
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DRAWN BY: BJK/RLH DATE: 05/17/07
CHECKED BY: JAZ DATE: 05/17/07
APPROVED BY: RHW DATE: 06/01/07
DRAWING NO: 1530-72-B14
REFERENCE: .

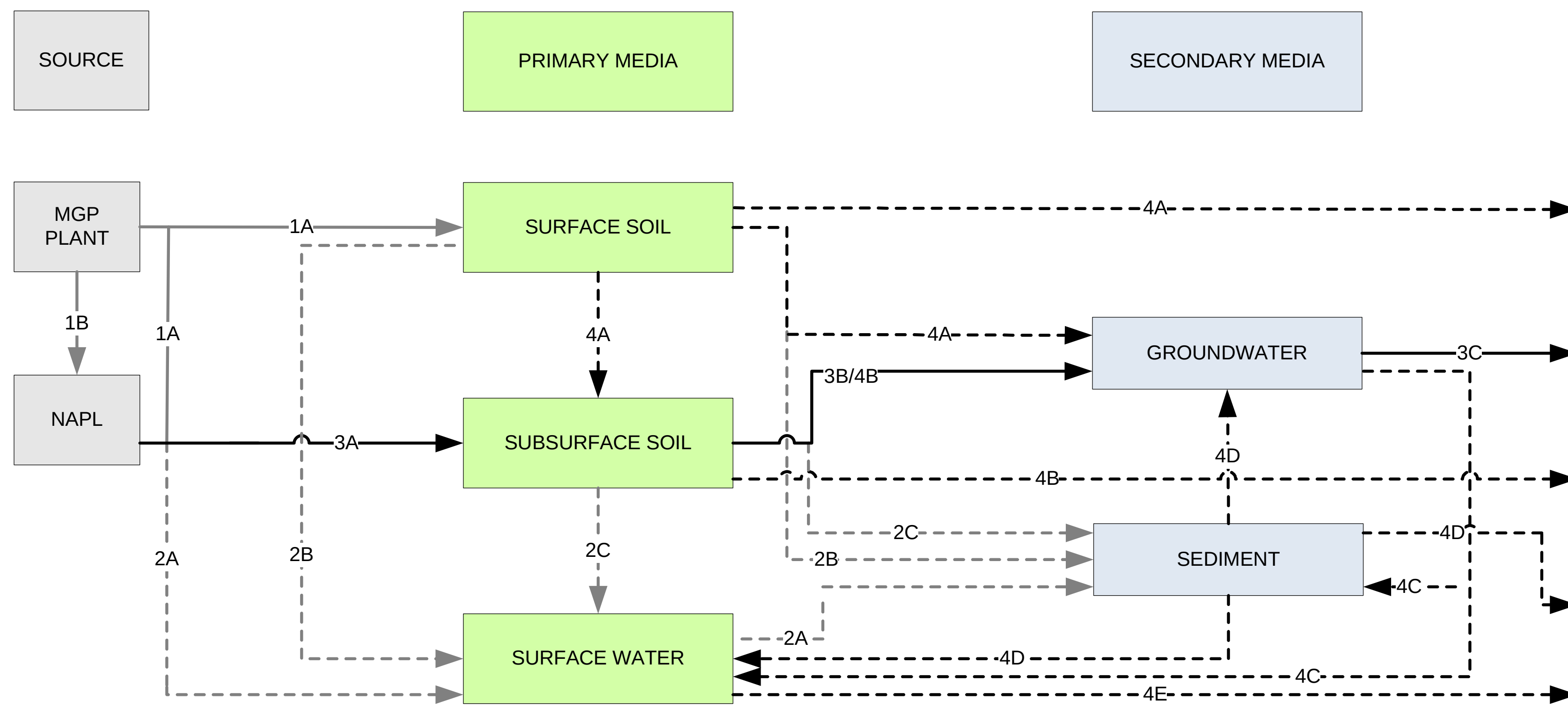
WATER TABLE ELEVATION CONTOURS NOVEMBER 28, 2005

SITE SPECIFIC WORK PLAN
FORMER WISCONSIN FUEL AND LIGHT COMPANY MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/7.2

FIGURE NO. 11



EXPOSURE ROUTE	HUMAN RECEPTORS				ECOLOGICAL RECEPTORS	
	INDUSTRIAL/ COMMERCIAL WORKER	CONSTRUCTION WORKER	RESIDENTIAL	RECREATIONAL	FISH	BENTHIC INVERTEBRATES
INGESTION	▲	▲	●	▲	NA	NA
DERMAL	▲	▲	●	▲	NA	NA
INHALATION	▲	▲	●	○	NA	NA
DERMAL	○	▲	○	○	NA	NA
INHALATION	▲*	▲	●*	○	NA	NA
INGESTION	●	▲	●	○	NA	NA
DERMAL	●	▲	●	○	NA	NA
INHALATION	▲*	▲	●*	○	NA	NA
INGESTION	○	○	○	▲	▲	▲
DERMAL	○	○	○	▲	▲	▲
INGESTION	○	○	○	▲	▲	▲
DERMAL	○	○	○	▲	▲	▲

GENERAL NOTES:

1. This site-specific Conceptual Site Model was developed based on the Generalized Conceptual Site Model Revision 0 and observations made during the January 5, 2007 site reconnaissance.
2. Exposure assumptions are presented in the Multi-Site Risk Assessment Framework Revision 0, dated September 5,2007.
3. Groundwater ingestion is not expected under current or future land use because there is a public water supply. Groundwater will not be quantitatively evaluated.
4. Birds (aquatic and upland) and mammals (aquatic and upland) are not considered to be receptors at the site due to insufficient habitat.
5. Refer to Section 4 of the report for additional discussion on the site specific CSM.

FOOTNOTES:

Known Historic

1A. MGP residuals were released to surface and subsurface soil during MGP operations which ceased in the 1950s.
1B. NAPL was released from the MGP plant, ceasing operations in the 1950s.

Potential Historic

2A. Records not complete to determine whether NAPL directly discharged to surface water (i.e. via historic trench).
2B. Surface soil erosion adjacent to river has been controlled with ISS and/or capping with asphalt.
2C. Subsurface soil erosion of river banks has been controlled with sheet pile wall installation and vegetated sloped banks.

Known

3A. NAPL currently observed at MW14 and surrounding subsurface soils to be further investigated for the presence of a coal tar UST.
3B NAPL exists and COPCs in subsurface soil may be soluble in groundwater.
3C. Ongoing groundwater monitoring indicates elevated COPCs. Public water supply limits exposure to human receptors for ingestion (see General Note 3 above). Groundwater characterization for additional COPCs is necessary to assess worker exposure risk.

Potential Current/Future

4A. Surface soil near former MGP structure areas will be characterized to assess worker exposure risk and possible future recreational land use, and to assess potential migration to subsurface soil and groundwater.
4B. Subsurface soil near former MGP structures will be characterized to assess worker exposure risk and the potential for on-going source to groundwater.
4C. Groundwater adjacent to the river will be characterized to assess the potential for on-going source (remaining below or adjacent to the ISS) to the sediment and surface water.
4D. Sediment will be characterized to assess potential risk for recreational use and ecological exposure risk.
4E. Surface water will be characterized to assess potential risk for recreational use and ecological exposure risk.

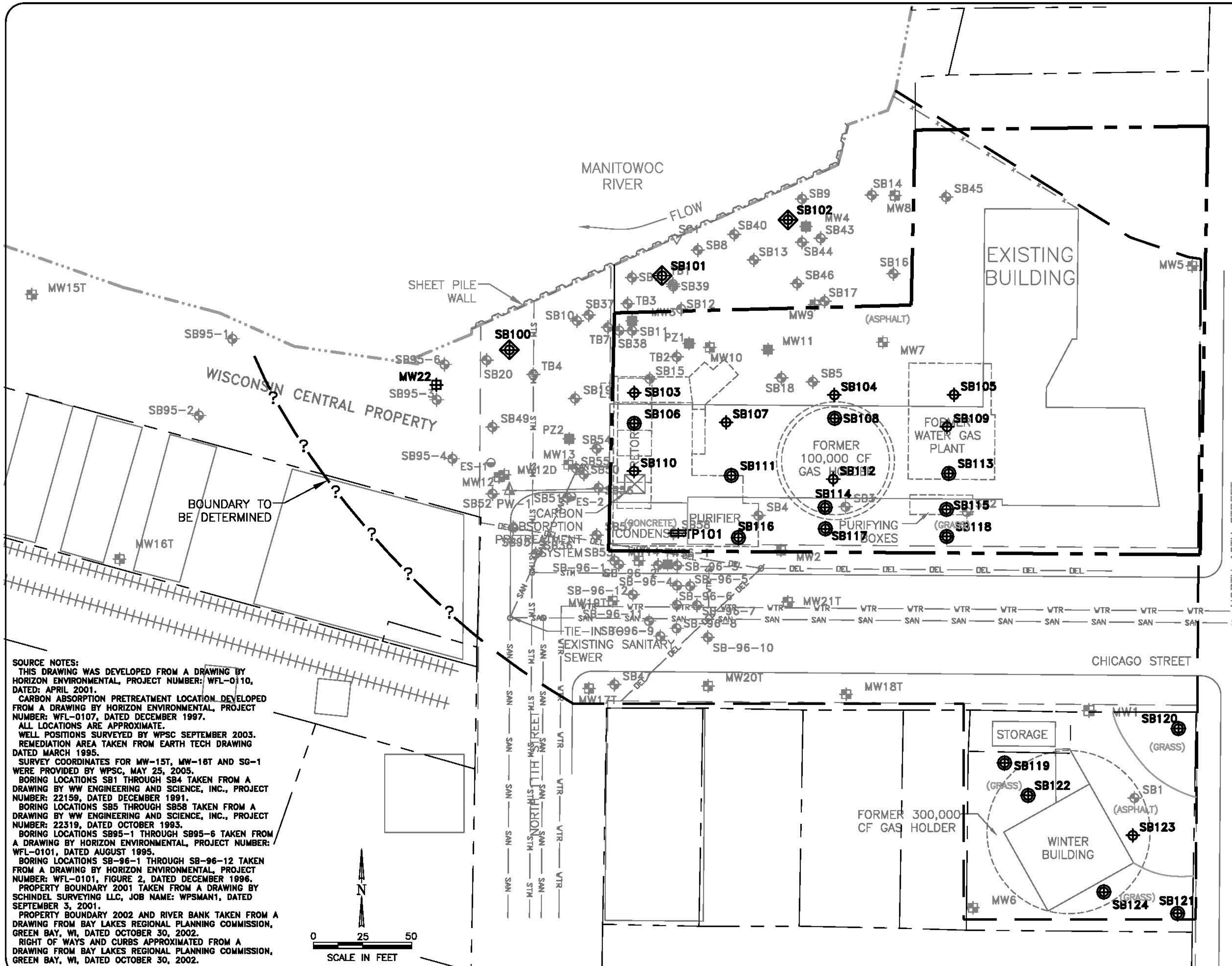
PATHWAY LEGEND:

▲ Pathway potentially complete and warrants further evaluation within the Baseline Risk Assessment.
● Pathway incomplete or considered insignificant under current land use condition, but potentially complete under future land use scenario.
○ Pathway not complete or considered insignificant; No further evaluation is recommended.
NA Not Applicable
* Inhalation exposure route may warrant further evaluation related to potential vapor intrusion into buildings based on subsurface soil conditions.

PATHWAY STATUS:

Known Historic
Potential Historic
Known
Potential Current / Future

PROJECT No. 1530	NATURAL RESOURCE TECHNOLOGY	SITE SPECIFIC CONCEPTUAL SITE MODEL FOR MANITOWOC FORMER MGP SITE	Drawn By: JTB	Date 04/02/2008
			Checked	JAZ
Figure 12		Wisconsin Public Service Corporation	Approved	JAZ



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LEGEND

MW7	MONITORING WELL
SG1	STAFF GAUGE
PZ1	ABANDONED PIEZOMETER
SB9	SOIL BORING
MW11	ABANDONED MONITORING WELL
ES-1	EXCAVATION SAMPLE
PW1	PUMPING WELL
TP101	PROPOSED TEST PIT
MW22	PROPOSED WATER TABLE MONITORING WELL WITH SOIL SAMPLE
SB107	PROPOSED SOIL BORING
SB106	PROPOSED SOIL BORING WITH SURFACE SOIL SAMPLE
SB101	PROPOSED SOIL BORING WITH GROUNDWATER SAMPLE
	WPSC ON-PROPERTY BOUNDARY
	PROPERTY BOUNDARY
	APPROXIMATE EXTENT OF UPLAND SITE
x — x	FENCE
	SHORELINE
WTR	WATER MAIN
SAN	SANITARY SEWER
STM	STORM SEWER
DEL	OVERHEAD POWERLINE
	SHEET PILE WALL
	RIGHT OF WAY
	UTILITY POLE
	HYDRANT
	MANHOLE
	FORMER MGP STRUCTURES
MGP	MANUFACTURED GAS PLANT

DRAWN BY: BJK	DATE: 03/20/08
CHECKED BY: JAZ	DATE: 04/02/08
APPROVED BY: JAZ	DATE: 04/09/08
DRAWING NO: 1530-72-B06-01	
REFERENCE: .	

PROPOSED SOIL EXPLORATION AND SAMPLING LOCATIONS

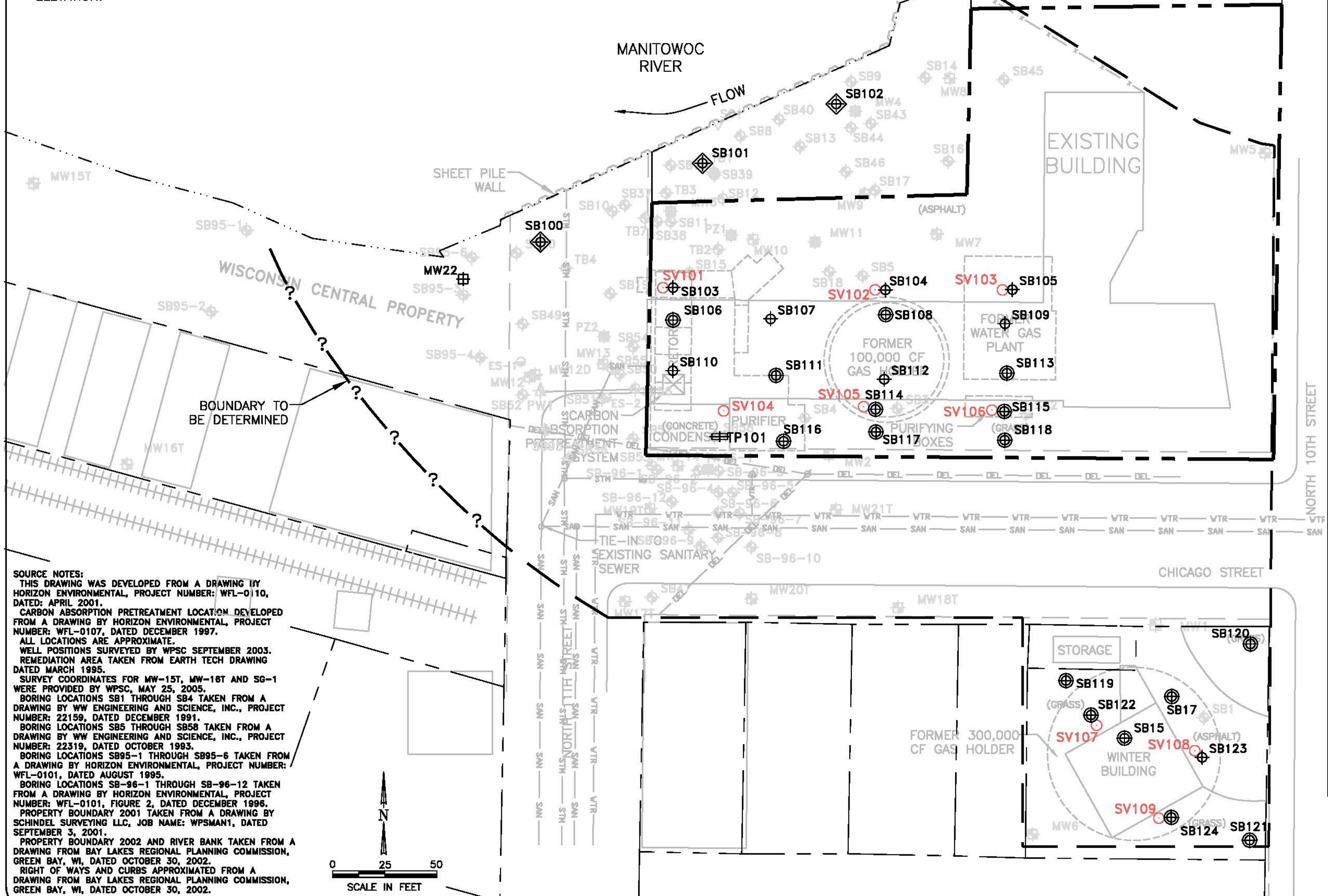
SITE SPECIFIC WORK PLAN
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/7.2

FIGURE NO. 13

NOTES:
1. REFER TO SECTION 6.5 OF THE WORK PLAN FOR BASIS OF DECISION FOR DETERMINING NEED FOR SOIL VAPOR SAMPLING.
2. SOIL VAPOR SAMPLING LOCATIONS SHOWN ARE TENTATIVE PENDING RESULTS OF SOIL BORINGS AND DECISION CRITERIA STATED IN SECTION 6.5.1.
3. PROPOSED SAMPLE DEPTHS ARE 3 AND 6 FT. BELOW LOWEST FLOOR ELEVATION.



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LEGEND

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SG1	STAFF GAUGE
PZ1	ABANDONED PIEZOMETER
SB9	SOIL BORING
MW11	ABANDONED MONITORING WELL
ES-1	EXCAVATION SAMPLE
PW1	PUMPING WELL
SV101	PROPOSED SOIL VAPOR PROBE
TP101	PROPOSED TEST PIT
MW22	PROPOSED WATER TABLE MONITORING WELL WITH SOIL SAMPLE
SB107	PROPOSED SOIL BORING
SB106	PROPOSED SOIL BORING WITH SURFACE SOIL SAMPLE
SB101	PROPOSED SOIL BORING WITH GROUNDWATER SAMPLE
	WPSC ON-PROPERTY BOUNDARY
	PROPERTY BOUNDARY
	APPROXIMATE EXTENT OF UPLAND SITE
—x—x—	FENCE
	SHORELINE
—WTR—	WATER MAIN
—SAN—	SANITARY SEWER
—STM—	STORM SEWER
—OEL—	OVERHEAD POWERLINE
	SHEET PILE WALL
	RIGHT OF WAY
	UTILITY POLE
	HYDRANT
	MANHOLE
	FORMER MGP STRUCTURES
MGP	MANUFACTURED GAS PLANT

DRAWN BY:	BJK	DATE:	04/04/08
CHECKED BY:	JAZ	DATE:	04/09/08
APPROVED BY:	JAZ	DATE:	04/09/08
DRAWING NO: 1530-72-B15C			
REFERENCE: .			

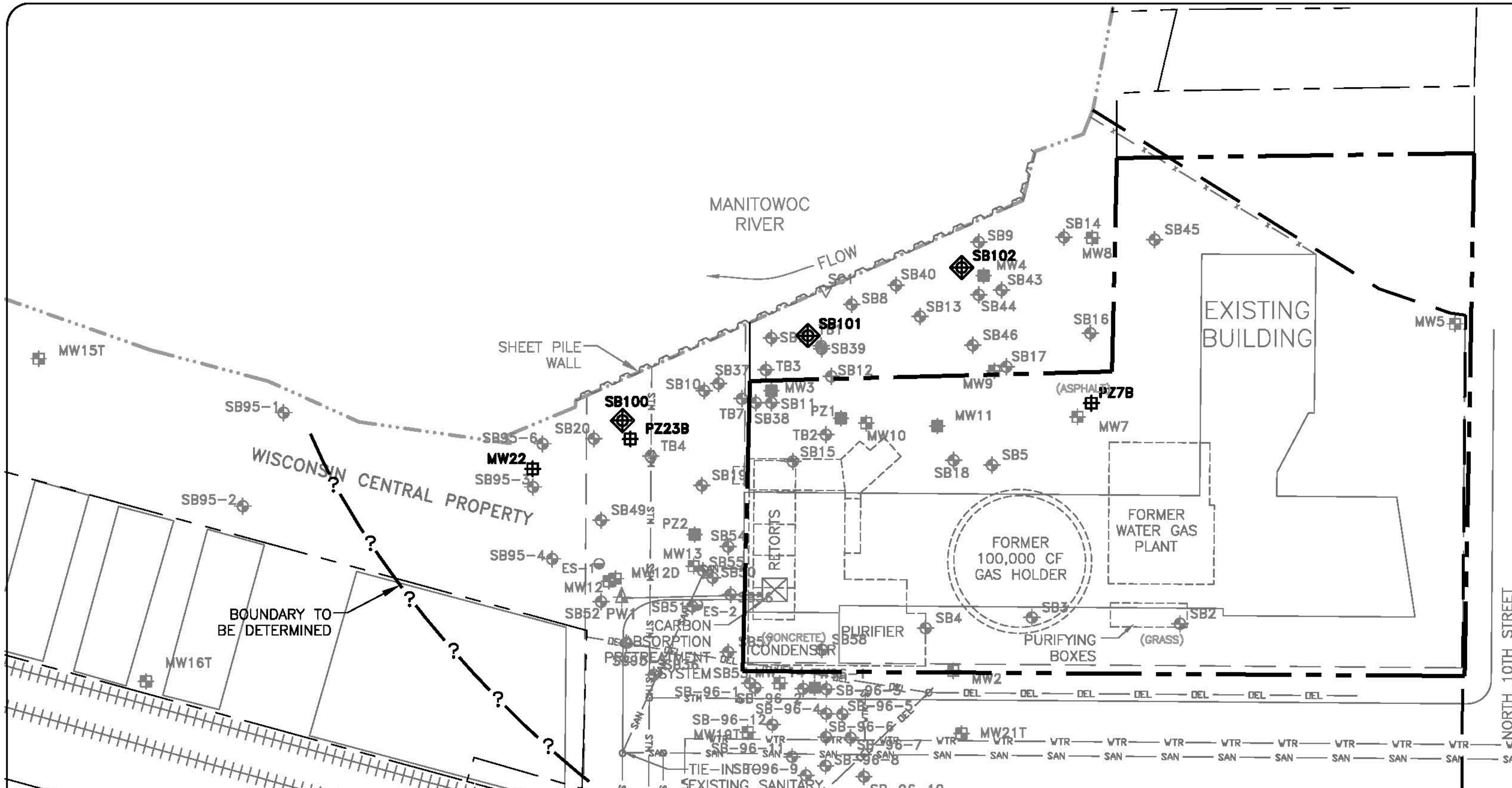
PROPOSED SOIL VAPOR SAMPLING LOCATIONS

SITE SPECIFIC WORK PLAN
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/7.2

FIGURE NO. 14



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PW1	PUMPING WELL
MW22	PROPOSED WATER TABLE MONITORING WELL
PZ23B	PROPOSED BEDROCK PIEZOMETER
SB101	PROPOSED SOIL BORING WITH GROUNDWATER SAMPLE
	WPSC ON-PROPERTY BOUNDARY
	PROPERTY BOUNDARY
	APPROXIMATE EXTENT OF UPLAND SITE
—x—x—	FENCE
	SHORELINE
—WTR—	WATER MAIN
—SAN—	SANITARY SEWER
—STM—	STORM SEWER
—DEL—	OVERHEAD POWERLINE
	SHEET PILE WALL
	RIGHT OF WAY
	UTILITY POLE
	HYDRANT
	MANHOLE
	FORMER MGP STRUCTURES
MGP	MANUFACTURED GAS PLANT

DRAWN BY: BJK/RLH DATE: 04/02/08
CHECKED BY: JAZ DATE: 04/02/08
APPROVED BY: RHW DATE: 04/09/08
DRAWING NO: 1530-72-B08-01
REFERENCE: .

PROPOSED WELL/PIEZOMETER LOCATIONS

SITE SPECIFIC WORK PLAN
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

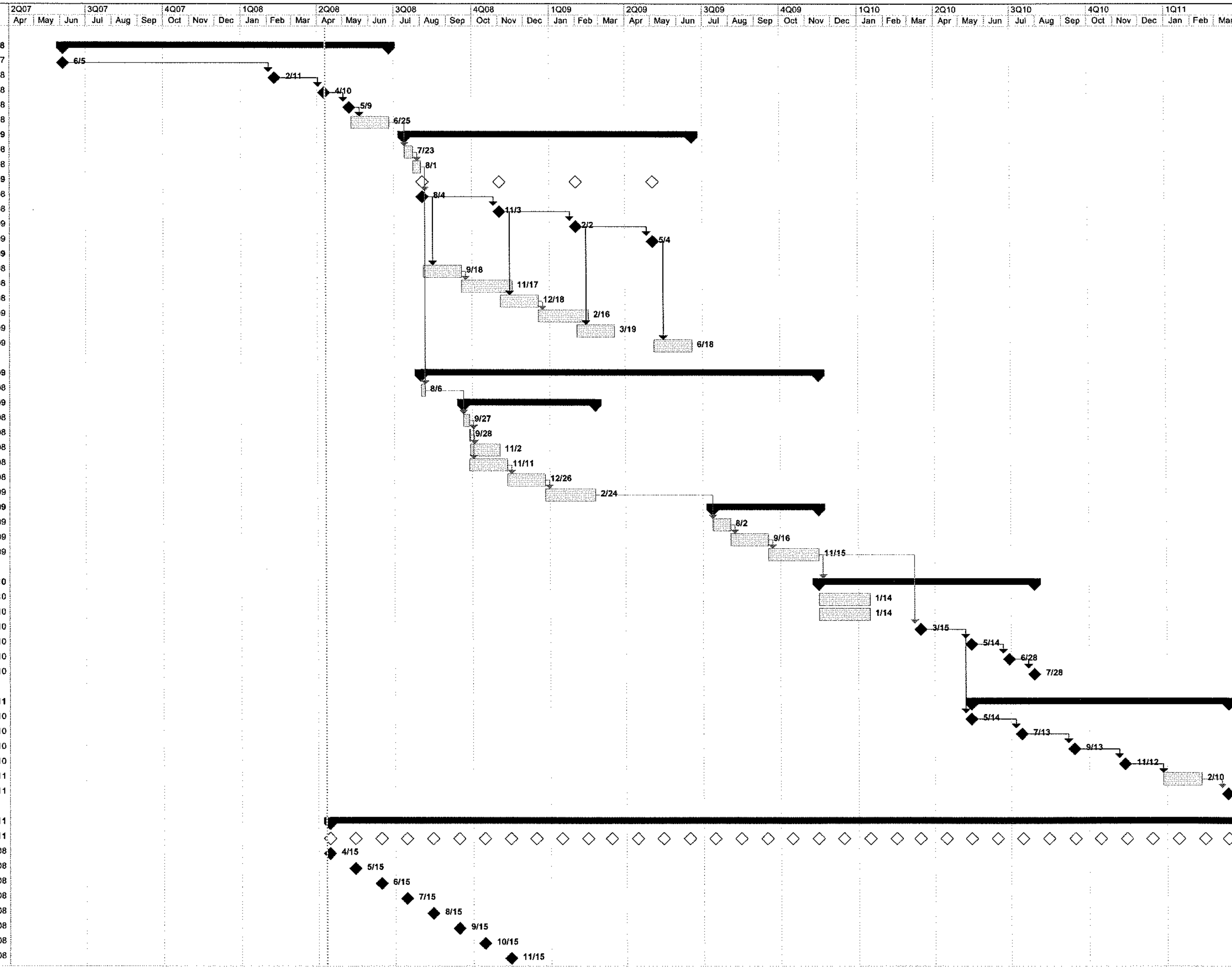
PROJECT NO.
1530/7.2

FIGURE NO.
15

FIGURE 16
RI/FS Preliminary Schedule
Manitowoc Former Manufactured Gas Plant Site
Wisconsin Public Service Corporation
WIN 000509949

Date: April 10, 2008

ID	Task Name	Duration	Start	Finish
1				
2	**Project Planning**	**387 days**	**Tue 6/5/07**	**Wed 6/25/08**
3	Submit Site Specific Work Plan Revision 0 to USEPA	0 days	Tue 6/5/07	Tue 6/5/07
4	Receive USEPA Comments on Draft SSWP Revision 0 and Partial Approval	0 days	Mon 2/11/08	Mon 2/11/08
5	Submit Site Specific Work Plan Revision 1 to USEPA	0 days	Thu 4/10/08	Thu 4/10/08
6	USEPA Approves SSWP Revision 1	0 days	Fri 5/9/08	Fri 5/9/08
7	Contract/Schedule RI Field Activities	45 days	Mon 5/12/08	Wed 6/25/08
8	**Field Activities - Upland**	**340 days**	**Mon 7/14/08**	**Thu 6/18/09**
9	Soil Boring Installation/Sampling	10 days	Mon 7/14/08	Wed 7/23/08
10	Install and Develop Groundwater Monitoring Wells	9 days	Thu 7/24/08	Fri 8/1/08
11	**Quarterly Groundwater Sampling Event**	**319 days**	**Mon 8/4/08**	**Thu 6/18/09**
12	Quarterly Groundwater Sampling Event 1	1 day	Mon 8/4/08	Mon 8/4/08
13	Quarterly Groundwater Sampling Event 2	1 day	Mon 11/3/08	Mon 11/3/08
14	Quarterly Groundwater Sampling Event 3	1 day	Mon 2/2/09	Mon 2/2/09
15	Quarterly Groundwater Sampling Event 4	1 day	Mon 5/4/09	Mon 5/4/09
16	**Quarterly Groundwater Fixed Based Laboratory Analysis**	**318 days**	**Tue 8/5/08**	**Thu 6/18/09**
17	Quarterly Groundwater Fixed Based Laboratory Analysis 1	45 days	Tue 8/5/08	Thu 9/18/08
18	Data Validation	60 days	Fri 9/19/08	Mon 11/17/08
19	Quarterly Groundwater Fixed Based Laboratory Analysis 2	45 days	Tue 11/4/08	Thu 12/18/08
20	Data Validation	60 days	Fri 12/19/08	Mon 2/16/09
21	Quarterly Groundwater Fixed Based Laboratory Analysis 3	45 days	Tue 2/3/09	Thu 3/19/09
22	Quarterly Groundwater Fixed Based Laboratory Analysis 4	45 days	Tue 5/5/09	Thu 6/18/09
23				
24	**Field Activities - River**	**471 days**	**Sat 8/2/08**	**Sun 11/15/09**
25	Pre-Approved Bathymetric, Side-Scan, Sub-Bottom Sonar Surveys	5 days	Sat 8/2/08	Wed 8/6/08
26	**Step I Sediment/Surface Water Sampling**	**157 days**	**Sun 9/21/08**	**Tue 2/24/09**
27	Identify Sediment Samples for Toxicity testing and COPCs	7 days	Sun 9/21/08	Sat 9/27/08
28	Surface Water Sampling	1 day	Sun 9/28/08	Sun 9/28/08
29	Toxicity Testing	35 days	Mon 9/29/08	Sun 11/2/08
30	Additional Laboratory Analysis	45 days	Sun 9/28/08	Tue 11/11/08
31	Sediment Sample Validation	45 days	Wed 11/12/08	Fri 12/26/08
32	Development of Dose Response and Site Specific Risk Values	60 days	Sat 12/27/08	Tue 2/24/09
33	**Step II Sediment Sampling**	**126 days**	**Mon 7/13/09**	**Sun 11/15/09**
34	Sediment Sampling for COCs	21 days	Mon 7/13/09	Sun 8/2/09
35	Additional Laboratory Analysis	45 days	Mon 8/3/09	Wed 9/16/09
36	Sediment Sample Validation	60 days	Thu 9/17/09	Sun 11/15/09
37				
38	**Remedial Investigation Reporting**	**255 days**	**Mon 11/16/09**	**Wed 7/28/10**
39	Baseline Risk Assessment (included in RI Report)	60 days	Mon 11/16/09	Thu 1/14/10
40	Current and Future Land Reuse Assessment (included in RI Report)	60 days	Mon 11/16/09	Thu 1/14/10
41	Submit RI Report Revision 0 to USEPA	0 days	Mon 3/15/10	Mon 3/15/10
42	Receive USEPA Comments on RI Report Revision 0	0 days	Fri 5/14/10	Fri 5/14/10
43	Submit RI Report Revision 1 to USEPA	0 days	Mon 6/28/10	Mon 6/28/10
44	USEPA Approves RI Report Revision 1	0 days	Wed 7/28/10	Wed 7/28/10
45				
46	**Feasibility Study Reporting**	**304 days**	**Fri 5/14/10**	**Mon 3/14/11**
47	Submit Development and Screening of Alternatives to USEPA	0 days	Fri 5/14/10	Fri 5/14/10
48	Receive USEPA comments on Development and Screening of Alternatives	0 days	Tue 7/13/10	Tue 7/13/10
49	Sumbit FS Report Revision 0 to USEPA	0 days	Mon 9/13/10	Mon 9/13/10
50	Receive USEPA Comments on FS Report Revision 0	0 days	Fri 11/12/10	Fri 11/12/10
51	Submit FS Report Revision 1 to USEPA	45 days	Tue 12/28/10	Thu 2/10/11
52	USEPA Approves FS Report Revision 1	1 day	Mon 3/14/11	Mon 3/14/11
53				
54	**Project Management Reporting**	**1217 days**	**Tue 4/15/08**	**Mon 8/15/11**
55	**Monthly Progress Reports**	**1217 days**	**Tue 4/15/08**	**Mon 8/15/11**
56	Monthly Progress Reports 1	0 days	Tue 4/15/08	Tue 4/15/08
57	Monthly Progress Reports 2	0 days	Thu 5/15/08	Thu 5/15/08
58	Monthly Progress Reports 3	0 days	Sun 6/15/08	Sun 6/15/08
59	Monthly Progress Reports 4	0 days	Tue 7/15/08	Tue 7/15/08
60	Monthly Progress Reports 5	0 days	Fri 8/15/08	Fri 8/15/08
61	Monthly Progress Reports 6	0 days	Mon 9/15/08	Mon 9/15/08
62	Monthly Progress Reports 7	0 days	Wed 10/15/08	Wed 10/15/08
63	Monthly Progress Reports 8	0 days	Sat 11/15/08	Sat 11/15/08



Project: 1530 Manitowoc RI FS schedule rev1 080410
Date: 4/10/08

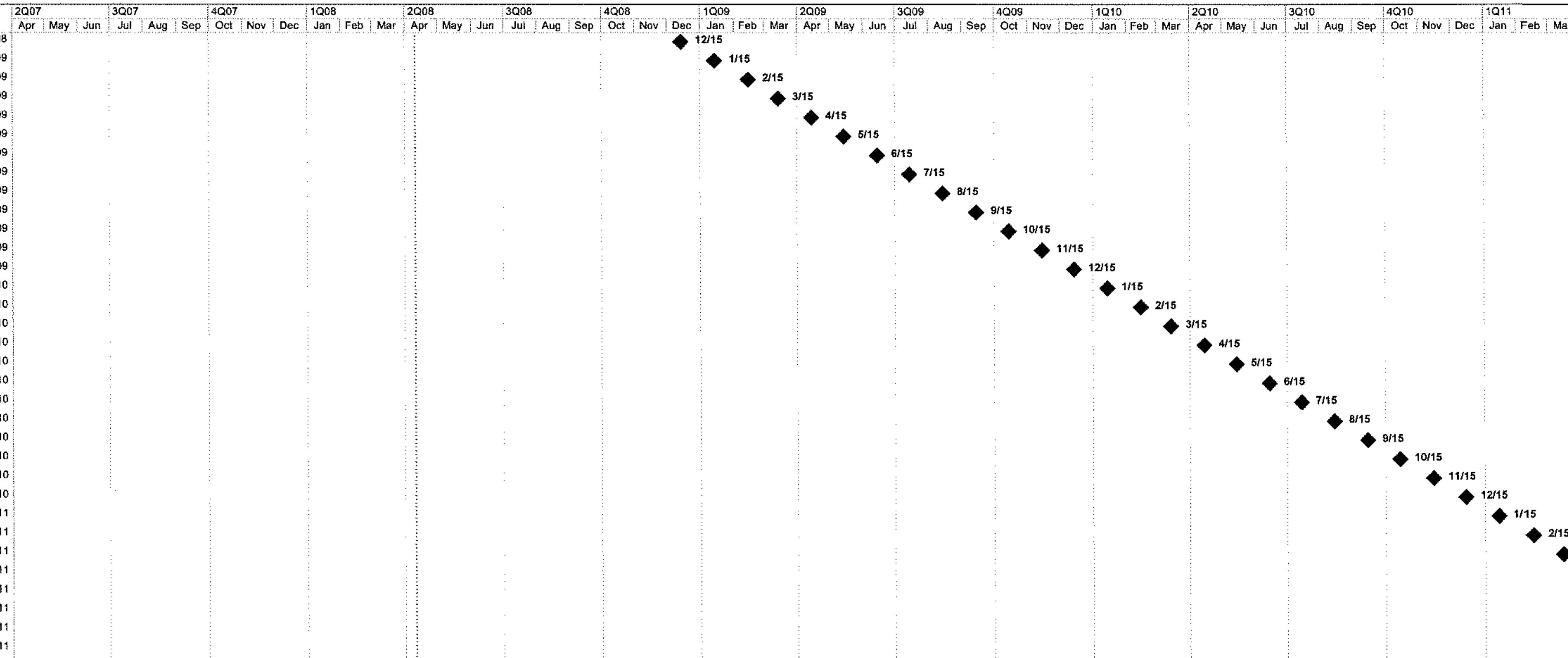
Task | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Milestone | Rolled Up Progress | Split | External Tasks | Project Summary | Group By Summary

1. This preliminary schedule is dependent on USEPA-approval and weather conditions to completed field investigations. Schedule modifications will be in accordance with the AOC/SOW (CERCLA Docket No. V-W-06-847).

FIGURE 16
RI/FS Preliminary Schedule
Manitowoc Former Manufactured Gas Plant Site
Wisconsin Public Service Corporation
WIN 000509949

Date: April 10, 2008

ID	Task Name	Duration	Start	Finish
64	Monthly Progress Reports 9	0 days	Mon 12/15/08	Mon 12/15/08
65	Monthly Progress Reports 10	0 days	Thu 1/15/09	Thu 1/15/09
66	Monthly Progress Reports 11	0 days	Sun 2/15/09	Sun 2/15/09
67	Monthly Progress Reports 12	0 days	Sun 3/15/09	Sun 3/15/09
68	Monthly Progress Reports 13	0 days	Wed 4/15/09	Wed 4/15/09
69	Monthly Progress Reports 14	0 days	Fri 5/15/09	Fri 5/15/09
70	Monthly Progress Reports 15	0 days	Mon 6/15/09	Mon 6/15/09
71	Monthly Progress Reports 16	0 days	Wed 7/15/09	Wed 7/15/09
72	Monthly Progress Reports 17	0 days	Sat 8/15/09	Sat 8/15/09
73	Monthly Progress Reports 18	0 days	Tue 9/15/09	Tue 9/15/09
74	Monthly Progress Reports 19	0 days	Thu 10/15/09	Thu 10/15/09
75	Monthly Progress Reports 20	0 days	Sun 11/15/09	Sun 11/15/09
76	Monthly Progress Reports 21	0 days	Tue 12/15/09	Tue 12/15/09
77	Monthly Progress Reports 22	0 days	Fri 1/15/10	Fri 1/15/10
78	Monthly Progress Reports 23	0 days	Mon 2/15/10	Mon 2/15/10
79	Monthly Progress Reports 24	0 days	Mon 3/15/10	Mon 3/15/10
80	Monthly Progress Reports 25	0 days	Thu 4/15/10	Thu 4/15/10
81	Monthly Progress Reports 26	0 days	Sat 5/15/10	Sat 5/15/10
82	Monthly Progress Reports 27	0 days	Tue 6/15/10	Tue 6/15/10
83	Monthly Progress Reports 28	0 days	Thu 7/15/10	Thu 7/15/10
84	Monthly Progress Reports 29	0 days	Sun 8/15/10	Sun 8/15/10
85	Monthly Progress Reports 30	0 days	Wed 9/15/10	Wed 9/15/10
86	Monthly Progress Reports 31	0 days	Fri 10/15/10	Fri 10/15/10
87	Monthly Progress Reports 32	0 days	Mon 11/15/10	Mon 11/15/10
88	Monthly Progress Reports 33	0 days	Wed 12/15/10	Wed 12/15/10
89	Monthly Progress Reports 34	0 days	Sat 1/15/11	Sat 1/15/11
90	Monthly Progress Reports 35	0 days	Tue 2/15/11	Tue 2/15/11
91	Monthly Progress Reports 36	0 days	Tue 3/15/11	Tue 3/15/11
92	Monthly Progress Reports 37	0 days	Fri 4/15/11	Fri 4/15/11
93	Monthly Progress Reports 38	0 days	Sun 5/15/11	Sun 5/15/11
94	Monthly Progress Reports 39	0 days	Wed 6/15/11	Wed 6/15/11
95	Monthly Progress Reports 40	0 days	Fri 7/15/11	Fri 7/15/11
96	Monthly Progress Reports 41	0 days	Mon 8/15/11	Mon 8/15/11



Project: 1530 Manitowoc RI FS schedule rev1 080410
Date: 4/10/08

Task | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Milestone | Rolled Up Progress | Split | External Tasks | Project Summary | Group By Summary

1. This preliminary schedule is dependent on USEPA-approval and weather conditions to completed field investigations. Schedule modifications will be in accordance with the AOC/SOW (CERCLA Docket No. V-W-06-847).

TABLES

Table 1 - Groundwater Monitoring Well Analytical Results - PVOCs and Cyanide
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 N. Tenth Street, Manitowoc, Wisconsin
USEPA ID# WIN000509949

		Petroleum Volatile Organic Compounds (µg/L)							Cyanides (mg/L) (field filtered)		
Sample Date	**Sample Location**	**Benzene**	**Ethylbenzene**	**Trimethylbenzene****	**Methyl-tert-butyl-ether**	**Toluene**	**Xylenes, total**	**Total BTEXs**	**Cyanide, total**	**Cyanide, weak acid dissociable**	**Cyanide, OIA-1677***
Wisconsin Groundwater Quality Standards (NR 140)											
Preventive Action Limit (PAL)		0.5	140	96	12	200	1,000	ns	ns	0.04	0.04
Enforcement Standard (ES)		**5**	**700**	**480**	**60**	**1,000**	**10,000**	ns	ns	**0.2**	**0.2**
MW-1	04/11/2000	--	--	--	--	--	--	--	--	--	--
	03/27/2001	<1.0	<1.0	<1.0	<5.0	<1.0	<3.0	nd	<0.005	--	--
	06/05/2002	<0.45	<0.82	<0.92	<0.43	<0.68	<0.77	nd	0.021 A	<0.0022	--
	05/15/2003	--	--	--	--	--	--	--	--	--	--
	05/24/2004	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	<0.0050
	05/18/2005	<0.41	<0.54	<0.97	<0.61	<0.67	<1.8	nd	--	--	--
	05/30/2006	0.21 Q	<0.40	<0.40	<0.36	<0.36	<0.74	0.21	--	--	--
	05/16/2007	4.7	1.3 Q	3.74 Q	<0.36	7.0	7.2	20.2	--	--	--
MW-2	04/11/2000	4.6	5.5	<1.0	<50	3.3	<3.0	13.40	0.18	--	--
	03/27/2001	1.4	40	2.8	<5.0	1.4	3.6	46.40	0.17	--	--
	06/05/2002	0.63 Q	18	1.6 Q	<0.43	0.85 Q	1.6 Q	21.08	0.043 A	0.010	--
	05/15/2003	0.79 Q	19	1.1 Q	<0.58	2.9	5.2	27.89	0.14	0.011	--
	05/24/2004	0.64	40	1.9	<0.36	3.2	7.3	51.14	--	--	0.020
	05/18/2005	<0.41	38	4.4	<0.61	0.94 Q	2.6 Q	41.54	--	--	--
Dup (QC-2)	05/18/2005	<0.41	37	4.3	<0.61	0.94 Q	2.4 Q	40.34	--	--	--
	05/30/2006	1.0	7.8	5.3	<0.36	<0.36	3.3 Q	12.10	--	--	--
	05/16/2007	2.3	4.8	1.2 Q	0.40 Q	<0.36	2.0 Q	9.1	--	--	--
MW-5	04/11/2000	--	--	--	--	--	--	--	--	--	--
	03/27/2001	--	--	--	--	--	--	--	--	--	--
	06/05/2002	<0.45	<0.82	<0.92	<0.43	<0.68	<0.77	nd	0.047 A	<0.0022	--
	05/15/2003	<0.30	<0.60	<0.66	<0.58	<0.58	<1.2	nd	0.0019 Q	0.0022 Q	--
Dup (Duplicate -1)	05/15/2003	<0.30	<0.60	<0.66	<0.58	<0.58	<1.2	nd	0.0032 Q	0.0024 Q	--
	05/24/2004	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	<0.0050
	05/18/2005	<0.41	<0.54	<0.97	<0.61	<0.67	<1.8	nd	--	--	--
	05/30/2006	0.44 Q	<0.40	<0.40	<0.36	<0.36	<0.74	0.44	--	--	--
	05/16/2007	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	--
Dup (051607017)	05/16/2007	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	--
MW-6	04/11/2000	<1.0	<1.0	<1.0	<50	<1.0	<3.0	nd	0.066	--	--
	03/27/2001	<1.0	4.1	<1.0	<5.0	<1.0	9.9	14	0.095	--	--
	10/25/2001	<1.0	<1.0	<1.0	<5.0	<1.0	<3.0	nd	--	--	--
	06/05/2002	<0.45	<0.82	<0.92	<0.43	<0.68	<0.77	nd	0.21 A	0.0099	--
	05/15/2003	<0.30	<0.60	<0.66	<0.58	<0.58	<1.2	nd	0.19	0.017	--
Dup (Duplicate -2)	05/15/2003	<0.30	<0.60	<0.66	<0.58	<0.58	<1.2	nd	0.18	0.014	--
	05/24/2004	Well no longer sampled - water level only									
MW-7	04/11/2000	<1.0	<1.0	<1.0	<50	<1.0	<3.0	nd	0.008	--	--
	03/27/2001	<1.0	<1.0	<1.0	<5.0	<1.0	<3.0	nd	0.18	--	--
	06/05/2002	<0.45	<0.82	<0.92	<0.43	<0.68	<0.77	nd	0.47	0.028	--
	05/15/2003	<0.30	<0.60	<0.66	<0.58	<0.58	<1.2	nd	0.35	0.032	--
	05/24/2004	Well no longer sampled - water level only									
MW-8	04/11/2000	<1.0	<1.0	<1.0	<50	<1.0	<3.0	nd	0.47	--	--
	03/27/2001	<1.0	<1.0	<1.0	<5.0	<1.0	<3.0	nd	0.35	--	--
	06/05/2002	<0.45	<0.82	<0.92	<0.43	<0.68	<0.77	nd	1.8	0.073	--
Dup (QC2)	06/05/2002	<0.45	<0.82	<0.92	<0.43	<0.68	<0.77	nd	1.3	0.015	--
	05/15/2003	<0.30	<0.60	<0.66	<0.58	<0.58	<1.2	nd	1.2	0.090	--
	05/24/2004	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	0.011
	05/18/2005	<0.41	<0.54	<0.97	<0.61	<0.67	<1.8	nd	--	--	--
	05/30/2006	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	--
	05/16/2007	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	--

Table 1 - Groundwater Monitoring Well Analytical Results - PVOCs and Cyanide
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 N. Tenth Street, Manitowoc, Wisconsin
USEPA ID# WIN000509949

		Petroleum Volatile Organic Compounds (µg/L)							Cyanides (mg/L) (field filtered)		
Sample Date	**Sample Location**	**Benzene**	**Ethylbenzene**	**Trimethylbenzene****	**Methyl-tert-butyl-ether**	**Toluene**	**Xylenes, total**	**Total BTEXs**	**Cyanide, total**	**Cyanide, weak acid dissociable**	**Cyanide, OIA-1677***
		Wisconsin Groundwater Quality Standards (NR 140)									
Preventive Action Limit (PAL)		*0.5*	*140*	*96*	*12*	*200*	*1,000*	ns	ns	*0.04*	*0.04*
Enforcement Standard (ES)		**5**	**700**	**480**	**60**	**1,000**	**10,000**	ns	ns	**0.2**	**0.2**
MW-9	04/11/2000	*3.1*	<1.0	<1.0	<50	<1.0	<3.0	3.1	0.42	--	--
	03/27/2001	**8.8**	<1.0	<1.0	<5.0	<1.0	<3.0	8.8	0.18	--	--
	06/05/2002	*0.94 Q*	<0.82	<0.92	<0.43	<0.68	<0.77	0.9	0.33 A	0.029	--
Dup (QC-1)	06/05/2002	*0.90 Q*	<0.82	<0.92	<0.43	<0.68	<0.77	0.9	0.21	0.018	--
	05/15/2003	*1.3*	<0.60	<0.66	<0.58	<0.58	<1.2	1.3	0.18	0.0091	--
	05/24/2004	0.30 Q	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	0.018
	05/18/2005	<0.41	<0.54	<0.97	<0.61	<0.67	<1.8	nd	--	--	--
	05/30/2006	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	--
	05/16/2007	<0.14	<0.40	0.65 Q	<0.36	<0.36	<0.74	nd	--	--	--
MW-10	04/11/2000	<1.0	<1.0	9	<50	<1.0	<3.0	nd	0.15	--	--
	03/27/2001	<1.0	<1.0	<1.0	<5.0	<1.0	<3.0	nd	0.11	--	--
	06/05/2002	<0.45	<0.82	<0.92	4.6	<0.68	<0.77	nd	0.28	0.010	--
	05/15/2003	<0.30	<0.60	13	3.2	<0.58	<1.2	nd	0.30	0.014	--
	05/24/2004	<0.14	<0.40	3.8	3.0	<0.36	<0.74	nd	--	--	0.015
	05/18/2005	<0.41	<0.54	7.5	1.3 Q	<0.67	<1.8	nd	--	--	--
	05/30/2006	<0.14	<0.40	1.3 Q	1.5	<0.36	<0.74	nd	--	--	--
	05/16/2007	<0.14	<0.40	17	0.84	<0.36	0.49 Q	0.49	--	--	--
MW-11	04/11/2000	<1.0	<1.0	<1.0	<50	<1.0	<3.0	nd	0.11	--	--
	03/27/2001	<1.0	<1.0	<1.0	<5.0	<1.0	<3.0	nd	0.14	--	--
	06/05/2002	<0.45	<0.82	<0.92	<0.43	<0.68	<0.77	nd	0.15 A	0.026	--
	05/15/2003	<0.30	<0.60	<0.66	<0.58	<0.58	<1.2	nd	0.14	0.016	--
	05/24/2004	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	<0.0050
Dup (QC-1)	05/24/2004	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	<0.0050
	05/18/2005	Well no longer sampled - will be abandoned									
	05/30/2006	Abandoned									
MW-12	04/11/2000	<1.0	<1.0	<1.0	<50	<1.0	<3.0	nd	0.8	--	--
	03/27/2001	<1.0	<1.0	<1.0	<5.0	<1.0	<3.0	nd	1.4	--	--
	06/05/2002	<0.45	<0.82	<0.92	<0.43	<0.68	<0.77	nd	0.73	0.016	--
	05/15/2003	Well was not accessible for sampling (covered with asphalt)									
	05/24/2004	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	0.015
	05/18/2005	<0.41	<0.54	<0.97	<0.61	<0.67	<1.8	nd	--	--	--
	05/30/2006	Could not obtain a representative sample due to stormwater runoff									
	6/20/2006	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	--
	5/16/2007	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	--
MW-12D	04/11/2000	<1.0	<1.0	<1.0	<50	<1.0	<3.0	nd	0.039	--	--
	03/27/2001	<1.0	<1.0	<1.0	<5.0	<1.0	<3.0	nd	0.036	--	--
	06/05/2002	<0.45	<0.82	<0.92	<0.43	<0.68	<0.77	nd	0.11 A	<0.011 N,C	--
	05/15/2003	<0.30	<0.60	<0.66	<0.58	<0.58	<1.2	nd	0.021	0.0041Q	--
	05/24/2004	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	<0.0050
Dup (QC-2)	05/24/2004	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	<0.0050
	05/18/2005	*2.3*	<0.54	<0.97	<0.61	<0.67	<1.8	2.3	--	--	--
Dup (QC-1)	05/18/2005	**5.3**	<0.54	<0.97	<0.61	<0.67	<1.8	5.3	--	--	--
	05/30/2006	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	--
	05/16/2007	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	--
Dup (051607006)	05/16/2007	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	--
MW-13	04/11/2000	**1,800**	**5,800**	**720**	<50	*470*	*3,800*	11,870	0.36	--	--
	03/27/2001	**1,500**	**3,300**	**760**	<5.0	100	*2,700*	7,600	0.34	--	--
	06/05/2002	**2,600**	**4,800**	**790**	<8.6	**1,800**	*4,300*	13,500	0.21 A	<0.0022	--
	05/15/2003	**300**	*200*	*129*	<1.2	21	670	1,191	0.61	*0.051*	--
	05/24/2004	**210**	29	94	<0.36	6.3	400	645	--	--	0.0073
	05/18/2005	**270**	*670*	*138 Q*	<12	17 Q	530	1,487	--	--	--
	05/30/2006	**330 K**	*640 K*	*240 K*	<7.2 K	29 K	650 K	1,649	--	--	--
Dup (QC01)	05/30/2006	**330 K**	*650 K*	*241 K*	<7.2 K	29 K	660 K	1,669	--	--	--
	05/16/2007	**6.4**	1.0 Q	2.9 Q	<0.36	<0.36	6.7 Q	14.1	--	--	--

Table 1 - Groundwater Monitoring Well Analytical Results - PVOCs and Cyanide
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 N. Tenth Street, Manitowoc, Wisconsin
USEPA ID# WIN000509949

		Petroleum Volatile Organic Compounds (µg/L)							Cyanides (mg/L) (field filtered)		
Sample Date	**Sample Location**	**Benzene**	**Ethylbenzene**	**Trimethylbenzene****	**Methyl-tert-butyl-ether**	**Toluene**	**Xylenes, total**	**Total BTEXs**	**Cyanide, total**	**Cyanide, weak acid dissociable**	**Cyanide, OIA-1677***
		Wisconsin Groundwater Quality Standards (NR 140)									
Preventive Action Limit (PAL)		*0.5*	*140*	*96*	*12*	*200*	*1,000*	ns	ns	*0.04*	*0.04*
Enforcement Standard (ES)		**5**	**700**	**480**	**60**	**1,000**	**10,000**	ns	ns	**0.2**	**0.2**
MW-14	04/11/2000	**310**	*600*	**950**	<500	**4,000**	*4,100*	9,010	0.11	--	--
	03/27/2001	**410**	**810**	**1,110**	<5.0	**4,200**	*4,200*	9,620	0.054	--	--
	06/05/2002	Not sampled due to product being present									
	05/15/2003										
	05/24/2004										
	05/18/2005										
	05/30/2006										
	05/16/2007										
MW-17T	04/11/2000	<1.0	<1.0	<1.0	<50	<1.0	<3.0	nd	<0.005	--	--
	03/27/2001	<1.0	<1.0	<1.0	<5.0	<1.0	<3.0	nd	0.054	--	--
	06/05/2002	<0.45	<0.82	<0.92	<0.43	<0.68	<0.77	nd	0.0029 Q	<0.0022	--
	05/15/2003	<0.30	<0.60	<0.66	<0.58	<0.58	<1.2	nd	0.0060	0.0019	--
	05/24/2004	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	<0.0050
	05/18/2005	<0.41	<0.54	<0.97	<0.61	<0.67	<1.8	nd	--	--	--
	05/30/2006	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	--
	05/16/2007	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	--
MW-18T	04/11/2000	<1.0	<1.0	<1.0	<50	<1.0	<3.0	nd	<0.005	--	--
	03/27/2001	<1.0	<1.0	<1.0	<5.0	<1.0	<3.0	nd	<0.005	--	--
	06/05/2002	<0.45	<0.82	<0.92	<0.43	<0.68	<0.77	nd	<0.0021	<0.0022	--
	05/15/2003	<0.30	<0.60	<0.66	<0.58	<0.58	<1.2	nd	0.0058	0.0037 Q	--
	05/24/2004	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	<0.0050
	05/18/2005	<0.41	<0.54	<0.97	<0.61	<0.67	<1.8	nd	--	--	--
	05/30/2006	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	--
	05/16/2007	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	--
MW-19T	04/11/2000	<1.0	<1.0	<1.0	<50	<1.0	<3.0	nd	0.037	--	--
	03/27/2001	<1.0	1.7	<1.0	<5.0	<1.0	<3.0	nd	0.043	--	--
	06/05/2002	*2.4*	<0.82	<0.92	<0.43	<0.68	0.94 Q	3.3	0.029 A	0.0053 Q	--
	05/15/2003	<0.30	<0.60	<0.66	<0.58	<0.58	<1.2	nd	0.035	0.0046 Q	--
	05/24/2004	*1.1*	<0.40	<0.40	<0.36	<0.36	0.76 Q	1.9	--	--	<0.0050
	05/18/2005	<0.41	<0.54	<0.97	<0.61	<0.67	<1.8	nd	--	--	--
	05/30/2006	0.17 Q	<0.40	<0.40	<0.36	<0.36	<0.74	0.17	--	--	--
	05/16/2007	0.31 Q	<0.40	<0.40	<0.36	<0.36	<0.74	0.31	--	--	--
MW-20T	04/11/2000	<1.0	<1.0	<1.0	<50	<1.0	<3.0	nd	0.040	--	--
	03/27/2001	<1.0	<1.0	<1.0	<5.0	<1.0	<3.0	nd	0.061	--	--
	06/05/2002	<0.45	<0.82	<0.92	<0.43	<0.68	<0.77	nd	0.063 A	<0.0022	--
	05/15/2003	<0.30	<0.60	<0.66	<0.58	<0.58	<1.2	nd	0.051	0.0046 Q	--
	05/25/2004	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	<0.0050
	05/18/2005	<0.41	<0.54	<0.97	<0.61	<0.67	<1.8	nd	--	--	--
	05/30/2006	0.22 Q	<0.40	<0.40	0.88 Q	<0.36	<0.74	0.22	--	--	--
Dup (QC02)	05/30/2006	0.23 Q	<0.40	<0.40	0.85 Q	<0.36	<0.74	0.23	--	--	--
	05/16/2007	0.19 Q	<0.40	<0.40	0.80 Q	<0.36	<0.74	0.19	--	--	--
Dup (051607010)	05/16/2007	0.19 Q	<0.40	<0.40	0.86 Q	<0.36	<0.74	0.19	--	--	--
MW-21T	04/11/2000	<1.0	<1.0	<1.0	<50	<1.0	<3.0	nd	0.061	--	--
	03/27/2001	<1.0	<1.0	<1.0	<5.0	<1.0	<3.0	nd	0.075	--	--
	06/05/2002	<0.45	<0.82	<0.92	1.9	<0.68	<0.77	1.9	0.18	<0.0022	--
	05/15/2003	0.31 Q	<0.60	<0.66	1.6 Q	<0.58	<1.2	0.3	0.37	0.026	--
	05/24/2004	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	<0.0050
	05/18/2005	<0.41	<0.54	<0.97	<0.61	<0.67	<1.8	nd	--	--	--
	05/30/2006	<0.14	<0.40	<0.40	<0.36	<0.36	<0.74	nd	--	--	--
	05/16/2007	0.19 Q	<0.40	<0.40	1.8	<0.36	<0.74	0.19	--	--	--

[JTB/AAS-7/1/02][JTB/PAR-07/03][JKY/ -06/04][HMS/JAH-07/05][HMS/RJG-06/06][HMS/RJG 6/07]

Table 1 - Groundwater Monitoring Well Analytical Results - PVOCs and Cyanide
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 N. Tenth Street, Manitowoc, Wisconsin
USEPA ID# WIN000509949

		Petroleum Volatile Organic Compounds (µg/L)							Cyanides (mg/L) (field filtered)		
Sample Date	**Sample Location**	**Benzene**	**Ethylbenzene**	**Trimethylbenzene****	**Methyl-tert-butyl-ether**	**Toluene**	**Xylenes, total**	**Total BTEXs**	**Cyanide, total**	**Cyanide, weak acid dissociable**	**Cyanide, OIA-1677***
Wisconsin Groundwater Quality Standards (NR 140)											
Preventive Action Limit (PAL)		*0.5*	*140*	*96*	*12*	*200*	*1,000*	ns	ns	*0.04*	*0.04*
Enforcement Standard (ES)		**5**	**700**	**480**	**60**	**1,000**	**10,000**	ns	ns	**0.2**	**0.2**

Notes:

1) Pre-2002 data from Horizon Environmental reports.
2) Concentrations that attain or exceed an NR 140 PAL are *italicized/ underlined.*
3) Concentrations that attain or exceed an NR 140 ES are **underlined/ bold**.
4) Wells PW-1 and MW-12 were buried by asphalt and well MW-1 was dry during the 5/15/03 sampling event.
PVOCs: Petroleum volatile organic compounds.
ns: Standard has not been established.
-- : Analysis was not performed.
Dup (QC-1): Field duplicate sample.
****:** Standard is for 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene combined.
µg/L: Micrograms per liter.
mg/L: Milligrams per liter.
A: Laboratory note - Analyte detected in method blank. N = Spiked sample recovery not within control limits.
C: Laboratory note - Elevated levels due to matrix effects.
Q: Laboratory note - The analyte has been detected between the limit of detection (LOD) and limit of quantitation (LOQ).
D: Laboratory note - Analyte value from diluted analysis
***:** In May 2004, cyanide was analyzed using method OIA-1677.
K: Detection limit may be elevated due to the presence of an unrequested analyte.

Table 2 - Groundwater Monitoring Well Analytical Results - PAHs
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 N. Tenth Street, Manitowoc, Wisconsin
USEPA ID# WIN000509949

Sample Location	Sample Date	POLYNUCLEAR AROMATIC HYDROCARBONS (µg/L)																		
		1-Methyl-naphthalene	2-Methyl-naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a) anthracene	Benzo(a)pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene	Total PAHs
Wisconsin Groundwater Quality Standards (NR 140)																				
Preventive Action Limit (PAL)		ns	ns	ns	ns	*600*	ns	*0.02*	*0.02*	ns	ns	*0.02*	ns	*80*	*80*	ns	*8*	ns	*50*	ns
Enforcement Standard (ES)		ns	ns	ns	ns	**3,000**	ns	**0.2**	**0.2**	ns	ns	**0.2**	ns	**400**	**400**	ns	**40**	ns	**250**	ns
MW-1	04/11/2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/27/2001	--	<5.0	<5.0	<5.0	<5.0	2.4	**3**	**5.8**	<5.0	<5.0	<5.0	<2.0	7.7	<5.0	2.3	<5.0	<5.0	6.0	27
	06/05/2002	<0.54	<0.56	2.7	0.48 Q	<8.0 C	29 C	**46 C**	**55 C**	40 C	43 C	**48 C**	11 Q,C	*100 C*	4.5	34	<0.54	53 C	*86 C*	553
	05/15/2003	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/19/2003	<00.36	<0.34	<0.36	<0.38	0.70 Q	5.2	**8.2**	**8.6**	6.9	6.5	6.6	2.0	14 D	<0.34	6.1	<0.48	4.6	9.1	79
	02/25/2004	<0.34	<0.32	0.99 Q	0.43 Q	4.0	13 D	**19 D**	**16 D**	14 D	17 D	**19 D**	4.3	45 D	1.6	12 Q, D	2.3	21 D	32 D	222
	05/24/2004	<0.34	<0.32	<0.34	<0.36	0.58 Q	3.7	**5.3**	**5.0**	4.3	4.4	**4.5**	1.3	8.1	<0.32	3.9	<0.45	3.0	6.0	50
	05/18/2005	<0.80	<0.90	<0.78	<0.77	0.75 Q	4.4	**10**	**11**	9.8 &	10 &	**8.9 &**	2.1 Q&	13	<0.87	7.8 &	<0.89	4.7	9.5	92
	05/30/2006	<1.0	<1.1	<0.82	<0.81	2.4 Q	11	**18**	**20 Z**	16	18 Z	**17**	3.5 Q	32	<0.91	13	<1.2	9.2	23.0	183
	05/16/2007	0.95	1.5	<0.16	0.27 Q	0.77	2.2	**4.9**	**6.2 Z**	5.3	4.3 Z	**4.2**	1.2 Q	7.4	0.25 Q	4.5	1.7	2.6	5.5	54
MW-2	04/11/2000	--	<1.0	1.7	1.8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	3.5
	03/27/2001	--	8.6	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	8.6
	06/05/2002	14 D	0.035 Q	5.4 D	4.0 D	0.067	0.15	*0.17*	*0.16*	0.12	0.11	*0.12*	0.046 Q	0.28	0.94 Q,D	0.12	0.18	0.21	0.25	26
	05/15/2003	9.2 D*	0.023 Q*	3.8 D*	2.3 D*	0.055 Q*	0.12	*0.14*	*0.14*	0.11	0.10	*0.12*	0.033 Q	0.23 *	0.65 Q*D	0.100	0.19 I*	0.13 *	0.22 *	18
	02/25/2004	11 D	0.025 Q	4.9 D	2.8 Q, D	0.040 Q	0.083	*0.10*	*0.10*	0.091	0.090	*0.088*	0.024 Q	0.17	0.81 Q, D	0.079	0.20	0.13	0.17	21
	05/24/2004	10 D	0.019 Q	4.8 D	2.8 D	0.42	1.5 D	**1.4 D**	**1.1 D**	0.86 Q, D	1.1 Q, D	**1.4 D**	0.28	3.3 D	0.87 Q, D	0.76 Q, D	0.19	1.4 D	2.7 D	35
	05/18/2005	11 D	<0.45	4.2	2.7	<0.35	1.1 Q	**1.2**	**1.1 Q**	0.94 Q&	1.1 Q&	**1.1 &**	<0.44 &	2.3	0.52 Q	0.77 Q&	0.71 Q	0.74 Q	2.0	31
Dup (QC-2)	05/18/2005	7.2	<0.48	2.9	2.0	0.39 Q	1.5	**1.5**	**1.2 Q**	0.88 Q	1.4	**1.9**	<0.47	3.4	0.47 Q	0.68 Q	0.54 Q	1.20 Q	3.7	31
	05/30/2006	10	<0.46	5.6	3.5	0.70 Q	2.4	**2.4 Q**	**2.2 Z**	1.4 Q	2.1 QZ	**2.3 Q**	<0.77	5.5	0.77 Q	1.30 Q	<0.50	1.6	4.4	46
	05/16/2007	2.8 D	<0.056	1.7	1.0	0.18 Q	0.66	**0.74**	**0.67 Z**	0.50	0.61 Z	**0.60**	0.15 Q	1.5	0.32	0.49	0.12 Q	0.58	1.2	14
MW-5	04/11/2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/27/2001	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	06/05/2002	<0.40	<0.42	<0.27	<0.34	<0.30	1.7	**2.1**	**2.5**	1.9	1.6	**1.8**	0.56 Q	4.1	<0.32	1.6	<0.40	1.5	3.1	22
	05/15/2003	0.033 Q*	0.035 Q*	0.20 *	0.053 Q*	0.26 *	1.1 D	**1.5 D**	**2.3 D**	1.5 D	1.9 D	**2.3 D**	0.49	5.1 D*	0.24 *	1.1 Q,D	0.072 Q*I	2.8 D*	3.6 D*	25
Dup (Duplicate -1)	05/15/2003	<0.072	<0.068	<0.072	<0.076	<0.080	0.20	**0.26**	**0.39**	0.27	0.30	**0.40**	<0.064	1.1	<0.068	0.23 Q	0.48	0.57	0.69	4.9
	02/25/2004	<0.17	<0.16	<0.17	<0.18	<0.19	1.0	**1.6**	**1.6**	1.4	1.6	**1.6**	0.39 Q	3.0	<0.16	1.2	0.28 Q	0.87	2.1	17
	05/24/2004	<0.017	0.017 Q	0.068	0.022 Q	0.11	0.62 D	**0.89 D**	**1.2 D**	0.83 D	0.95 D	**1.1 D**	0.23	2.2 D	0.075	0.72 D	0.030 Q	0.92 D	1.6 D	12
	05/18/2005	<8.5	<9.6	<8.2	<8.2	<7.5	25 Q	**58**	**110**	75 &	98 &	**110 &**	18 Q&	*190*	<9.2	60 &	<9.5	48	*120*	912
	05/30/2006	<5.1	<5.6	<4.1	<4.1	6.7 Q	29	**56**	**99 Z**	62	73 Z	**84**	12 Q	*160*	<4.5	51 &	<6.2	40	*110*	783
	05/16/2007	<5.1	<5.6	<4.1	<4.1	8.6 Q	17 Q	**45**	**60 Z**	46	56 Z	**58**	10 Q	*96*	<4.5	38	<6.2	28	*66*	529
Dup (051607017)	05/16/2007	<0.20	<0.22	0.50 Q	0.48 Q	2.3	8.8 QD	**20 D**	**31 ZD**	21 D	22 ZD	**24 D**	4.8	43 D	0.69	19 D	<0.25	12 D	30 D	240

NATURAL RESOURCE TECHNOLOGY

Table 2 - Groundwater Monitoring Well Analytical Results - PAHs
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 N. Tenth Street, Manitowoc, Wisconsin
USEPA ID# WIN000509949

Sample Location	Sample Date	POLYNUCLEAR AROMATIC HYDROCARBONS (µg/L)																		
		1-Methyl-naphthalene	2-Methyl-naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a) anthracene	Benzo(a)pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene	Total PAHs
Wisconsin Groundwater Quality Standards (NR 140)																				
Preventive Action Limit (PAL)		ns	ns	ns	ns	*600*	ns	*0.02*	*0.02*	ns	ns	*0.02*	ns	*80*	*80*	ns	*8*	ns	*50*	ns
Enforcement Standard (ES)		ns	ns	ns	ns	**3,000**	ns	**0.2**	**0.2**	ns	ns	**0.2**	ns	**400**	**400**	ns	**40**	ns	**250**	ns
MW-6	04/11/2000	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	nd
	03/27/2001	--	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	nd
	06/05/2002	<0.027	<0.028	<0.018	0.040 Q	<0.020	0.032 Q	*0.032 Q*	*0.029 Q*	0.047 Q	0.023 Q	*0.027 Q*	<0.017	0.069 Q	<0.021	0.020 Q	<0.027	0.033 Q	0.059 Q	0.4
	05/15/2003	<0.018	<0.017	<0.018	0.043 Q	<0.020	0.032 Q	*0.041 Q*	*0.042*	0.032 Q	0.033 Q	*0.034 Q*	<0.016	0.058	<0.017	0.027 Q	0.051 Q	0.029 Q	0.056	0.5
Dup (Duplicate -2)	05/15/2003	0.022 Q	<0.017	<0.018	0.038 Q	<0.020	0.016 Q	0.019 Q	*0.020 Q*	0.018 Q	<0.019	*0.020 Q*	<0.016	0.033 Q	<0.017	<0.021	0.15	0.017 Q	0.032 Q	0.4
	02/25/2004	0.018 Q	0.026 Q	<0.017	0.067	<0.019	0.023 Q	*0.026 Q*	*0.024 Q*	0.021 Q	0.019 Q	*0.022 Q*	<0.015	0.045	<0.016	<0.020	0.090	0.029 Q	0.040 Q	0.5
	05/24/2004	Well no longer sampled - water level only																		
MW-7	04/11/2000	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	nd
	03/27/2001	--	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	nd
	06/05/2002	<0.027	<0.028	<0.018	0.30	0.13	0.39	**0.53 D**	**0.41**	0.43	0.32	**0.31**	0.14	0.40	<0.021	0.36	0.029 Q	0.097	0.53 D	4.4
	05/15/2003	<0.018 *	<0.017 *	<0.018 *	0.11 *	0.13 *	0.22	**0.44**	**0.67 D**	0.54 D	0.44	**0.54 D**	0.12	0.87 D*	<0.017 *	0.43	0.026 Q*I	0.20 *	0.69 D*	5.4
	02/25/2004	<0.017	0.022 Q	0.037 Q	0.24	0.26	1.5 D	**3.0 D**	**4.7 D**	3.4 D	3.3 D	**4.2 D**	0.65 Q, D	9.2 D	0.059	2.8 D	0.097	2.0 D	6.0 D	41
	05/24/2004	Well no longer sampled - water level only																		
MW-8	04/11/2000	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	nd
	03/27/2001	--	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	nd
	06/05/2002	<0.67	<0.70	<0.45	1.0 Q	1.0 Q	3.7	**4.0**	**3.0**	2.5	2.5	**2.7**	0.73 Q	7.0	<0.53	2.4	<0.67	2.0	5.9	38
Dup (QC2)	06/05/2002	<0.54	<0.56	<0.36	1.0 Q	1.0 Q	4.9	**5.3**	**4.1**	3.8	3.3	**3.7**	0.97 Q	9.8	<0.42	3.1	4.9	2.8	8.4	57
	05/15/2003	<0.18 *	<0.17 *	<0.18 *	0.61 *	0.43 Q*	1.5	**2.0**	**1.6**	1.5	1.4	**1.4**	0.34 Q	2.7 *	<0.17 *	1.3	<0.24 *	0.70 *	2.6 *	18
	02/25/2004	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/24/2004	<0.34	<0.32	<0.34	1.0 Q	0.68 Q	2.3	**2.8**	**2.3**	2.0	1.8	**2.0**	0.56 Q	4.4	<0.32	1.8	<0.45	1.2	3.9	27
	05/18/2005	<0.80	<0.91	<0.78	2.0 Q	1.8 Q	5.5	**7.8**	**6.2**	5.6 &	6.6 &	**6.3 &**	1.2 Q&	13	<0.87	4.5 &	<0.89	3.7	12	76
	05/30/2006	<0.41	<0.46	<0.33	1.6	1.6	4.4	**5.2**	**4.6 Z**	3.4	3.6 Z	**3.9**	0.81 Q	9.5	<0.37	2.9 &	<0.50	2.8	8.0	52
	05/16/2007	0.023 Q	0.044	0.042	1.0 D	0.66 QD	2.5 D	**4.0 D**	**3.0 DZ**	2.7 D	3.2 DZ	**2.7 D**	0.56 QD	5.4 D	0.081	2.4 D	0.071	1.2 D	4.8 D	34

Table 2 - Groundwater Monitoring Well Analytical Results - PAHs
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 N. Tenth Street, Manitowoc, Wisconsin
USEPA ID# WIN000509949

Sample Location	Sample Date	POLYNUCLEAR AROMATIC HYDROCARBONS (µg/L)																		
		1-Methyl-naphthalene	2-Methyl-naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a) anthracene	Benzo(a)pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene	Total PAHs
Wisconsin Groundwater Quality Standards (NR 140)																				
Preventive Action Limit (PAL)		ns	ns	ns	ns	*600*	ns	*0.02*	*0.02*	ns	ns	*0.02*	ns	*80*	*80*	ns	*8*	ns	*50*	ns
Enforcement Standard (ES)		ns	ns	ns	ns	**3,000**	ns	**0.2**	**0.2**	ns	ns	**0.2**	ns	**400**	**400**	ns	**40**	ns	**250**	ns
MW-9	04/11/2000	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	nd
	03/27/2001	--	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	nd
	06/05/2002	0.039 Q	<0.028	0.14	0.21	0.22	0.87 D	**0.96 D**	**0.97 D**	0.75 D	0.60 D	**0.75 D**	0.31	2.1 D	0.041 Q	0.65 D	0.12	0.41	1.8 D	11
Dup (QC-1)	06/05/2002	<0.34	<0.35	<0.23	<0.29	0.38 Q	1.8	**2.1**	**2.2**	1.6	1.4	**1.6**	0.51 Q	3.8	<0.26	1.4	<0.34	0.90	3.2	21
	05/15/2003	<1.8 *	< 1.7 *	<1.8 *	<1.9 *	2.2 Q*	10	**12**	**12**	9.5	11	**13**	2.4 Q	29 *	<1.7 *	7.7	<2.4 *	10 *	23 *	142
	02/25/2004	<0.091	<0.086	<0.091	<0.096	<0.10	0.21	**0.4**	**0.72**	0.54	0.48	**0.59**	0.098 Q	1.3	<0.086	0.45	<0.12	0.25 Q	0.94	6.0
	05/24/2004	0.11	0.046 Q	0.19	0.29	0.38	1.5 D	**2.6 D**	**3.4 D**	2.6 D	2.6 D	**2.9 D**	0.66 Q, D	5.5 D	0.086	2.2 D	0.35	1.0 D	4.1 D	31
	05/18/2005	<0.16	<0.18	<0.16	0.19 Q	0.29 Q	0.94	**1.9**	**2.5**	2.2 &	2.0 &	**1.9 &**	0.45 Q&	3.1	<0.17	1.7 &	<0.18	0.58	2.4	20
	05/30/2006	<0.20	<0.22	<0.16	0.18 Q	0.28 Q	1.3	**2.9**	**4.6 Z**	3.3	3.1 Z	**3.4**	0.63 Q	5.6	<0.18	2.6	0.38 Q	0.91	3.8	33
	05/16/2007	0.14 Q	<0.11	0.20 Q	0.26 Q	0.29 Q	0.42 Q	**0.78**	**1.1 Z**	0.9	0.92 Z	**0.79**	0.20 Q	1.8	0.14 Q	0.79	0.25 Q	0.66	1.4	11
MW-10	04/11/2000	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	nd
	03/27/2001	--	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	nd
	06/05/2002	<0.090	<0.093	0.85	0.38	0.29	0.42	**0.43**	**0.32**	0.34	0.23	**0.27**	0.095 Q	1.0	0.64	0.28	0.090 Q	0.16 Q	1.0	6.8
	05/15/2003	0.28Q*	<0.085 *	0.86 *	0.38 *	0.32 *	0.65	**0.80**	**0.83**	0.68	0.64	**0.73**	0.18 Q	1.3 *	0.47 *	0.56	0.28 Q*I	0.33 *	1.4 *	11
	02/25/2004	0.14	0.17	0.55 Q, D	0.43	0.29	0.93 D	**1.4 D**	**1.7 D**	1.4 D	1.3 D	**1.5 D**	0.33	3.1 D	0.43	1.1 D	0.39	0.75 D	2.4 D	18
Dup (QC-1)	02/25/2004	0.071	0.072	0.40	0.13	0.080	0.13	*0.17*	*0.17*	0.16	0.16	*0.17 Q*	0.039 Q	0.41	0.35	0.14	0.17	0.14	0.33	3.3
	05/24/2004	0.21	0.040 Q	0.77 D	0.29	0.26	0.71 D	**1.2 D**	**1.4 D**	1.2 D	1.3 D	**1.4 D**	0.31	2.8 D	0.37	0.96 D	0.47	0.57 D	2.2 D	16
	05/18/2005	0.45 Q	<0.23	0.66	0.7	0.49 Q	1.2	**2.0**	**2.3**	2.1 &	2.0 &	**2.1 &**	0.39 Q&	3.8	0.31 Q	1.6 &	0.25 Q	0.84	3.2	24
	05/30/2006	0.17 Q	<0.058	0.81	0.38	0.30	0.67	**1.1**	**1.2 Z**	1.0	1.0 Z	**1.0**	0.20 Q	2.1	0.34	0.79	0.087 Q	0.37	1.7	13
	05/16/2007	0.82 D	0.13	0.63 D	0.17 D	0.17	0.33	**0.58 D**	**0.71 DZ**	0.64 D	0.60 DZ	**0.51 D**	0.15	1.0 D	0.16	0.54 D	0.13	0.24	0.77 D	8.3
MW-11	04/11/2000	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	nd
	03/27/2001	--	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	nd
	06/05/2002	0.25	<0.028	0.16	0.32	0.11	0.18	**0.20**	*0.16*	0.16	0.12	*0.15*	0.047 Q	0.39	0.050 Q	0.13	0.048 Q	0.090	0.45	3.0
	05/15/2003	0.28 *	0.026 Q*	0.35 *	0.25 *	0.13 *	0.39	**0.53 D**	**0.64 D**	0.52 D	0.49	**0.49**	0.14	0.89 D*	0.12 *	0.46	0.046 Q*I	0.17 *	0.80 D*	6.7
	02/25/2004	0.047 Q	0.035 Q	0.096	0.23	0.069	0.10	*0.14*	*0.15*	0.14	0.12	*0.13 Q*	0.035 Q	0.30	0.10	0.11	0.087	0.11	0.26	2.3
Dup (QC-2)	02/25/2004	0.042 Q	0.036 Q	0.097	0.21	0.12	0.77 D	**1.2 D**	**1.1 D**	1.0 D	1.1 D	**1.1 D**	0.030	2.4 D	0.10	0.85 D	0.097	0.64 D	1.7 D	13
	05/24/2004	0.10	0.019 Q	0.23	0.27	0.14	0.26	**0.42**	**0.46 D**	0.45	0.35	**0.40**	0.12	0.72 D	0.15	0.38	0.033 Q	0.15	0.64 Q	5
Dup (QC-1)	05/24/2004	0.073	<0.016*	0.18 *	0.20 *	0.13 *	0.29	**0.45**	**0.48 D**	0.45	0.41	**0.43**	0.11	0.85 D*	0.12	0.39	0.064 Q	0.16 *	0.68 D*	5
	05/18/2005	Well no longer sampled - will be abandoned																		
	05/30/2006	Abandoned																		

Table 2 - Groundwater Monitoring Well Analytical Results - PAHs
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 N. Tenth Street, Manitowoc, Wisconsin
USEPA ID# WIN000509949

Sample Location	Sample Date	1-Methyl-naphthalene	2-Methyl-naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a) anthracene	Benzo(a)pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene	Total PAHs
		POLYNUCLEAR AROMATIC HYDROCARBONS (µg/L)																		
Wisconsin Groundwater Quality Standards (NR 140)																				
Preventive Action Limit (PAL)		ns	ns	ns	ns	*600*	ns	*0.02*	*0.02*	ns	ns	*0.02*	ns	*80*	*80*	ns	*8*	ns	*50*	ns
Enforcement Standard (ES)		ns	ns	ns	ns	**3,000**	ns	**0.2**	**0.2**	ns	ns	**0.2**	ns	**400**	**400**	ns	**40**	ns	**250**	ns
MW-12	04/11/2000	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	nd
	03/27/2001	--	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	nd
	06/05/2002	<0.027	<0.028	<0.018	0.025 Q	0.053 Q	0.61 C	**0.65 C**	**0.80 C**	0.59 C	0.48	**0.53 C**	0.21	1.0 D	<0.021	0.49 C	0.056 Q	0.23	1.1 D	6.8
	05/15/2003	Well was not accessible for sampling (covered by asphalt)																		
	02/25/2004	Well was not accessible for sampling (under water from surface runoff)																		
	05/24/2004	<0.34	<0.32	<0.34	<0.36	<0.38	2.7	**5.2**	**6.2**	5.3	4.7	**4.7**	1.4	7.7	<0.32	4.6	<0.45	1.6	5.8	50
	05/18/2005	<0.80	<0.91	<0.78	<0.77	<0.71	4.5	**9.5**	**11**	11 &	10 &	**8.9 &**	2.2 Q&	13	<0.87	8.3 &	<0.89	2.5 Q	10	91
	05/30/2006	Could not obtain a representative sample due to stormwater runoff																		
	6/20/2006	<0.81	<0.90	<0.65	<0.65	1.8 Q	5.6	**13**	**16 Z**	20	13 Z	**12**	3.9 Q	19	<0.72	15	<0.99	3.4	15	138
	5/16/2007	<0.20	<0.22	<0.16	0.22 Q	0.47 Q	3.1	**7.4**	**9.4 Z**	5.0 D	6.6 Z	**5.7**	1.8	9.0	<0.18	7.9	<0.25	1.7	6.8	65
MW-12D	04/11/2000	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	nd
	03/27/2001	--	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	nd
	06/05/2002	<0.16	<0.17	<0.11	<0.14	<0.12	0.67	**0.76**	**0.96**	0.61	0.63	**0.68**	0.16 Q	1.9	<0.13	0.59	<0.16	0.55	1.5	9.0
	05/15/2003	<0.018 *	<0.017 *	<0.018 *	0.059 Q*	0.051 Q*	0.52 D	**0.92 D**	**1.2 D**	0.93 D	1.1 D	**1.1 D**	0.28	1.6 D*	<0.017 *	0.73 D	0.065 Q*I	0.34 *	1.2 D*	10
	02/25/2004	Well was not accessible for sampling (interior of flush mount frozen)																		
	05/24/2004	<0.34	<0.32	<0.34	<0.36	<0.38	0.95	**2.2**	**2.9**	2.6	2.1	**2.0**	0.64 Q	3.2	<0.32	2.2	<0.45	0.67 Q	2.5	22
Dup (QC-2)	05/24/2004	<0.017	<0.016*	<0.017*	0.034 Q *	0.049 Q *	0.46	**0.90 D**	**1.1 D**	1.0 D	0.92 D	**0.85 D**	0.28	1.5 D *	<0.016	0.85 D	0.045 Q	0.26 *	1.0 D *	9.0
	05/18/2005	0.10 Q	<0.091	<0.078	0.11 Q	<0.071	0.45	**0.84**	**1.2**	1.0 &	0.88 &	**0.8 &**	0.22 Q&	1.1	<0.087	0.80 &	0.5	0.21 Q	0.80	8.9
Dup (QC-1)	05/18/2005	<0.10	<0.11	<0.097	0.12 Q	<0.088	0.51	**0.94**	**1.2**	1.0	1.1	**0.93**	0.21 Q	1.1	<0.11	0.81	<0.11	0.25 Q	0.97	9.1
	05/30/2006	<0.010	<0.011	<0.0082	0.016 Q	0.014 Q	0.086	*0.19*	**0.24 Z**	0.24	0.20 Z	*0.16*	0.047 Q	0.21	<0.0091	0.18	0.024 Q	0.041	0.18	1.8
	05/16/2007	0.025 Q	0.014 Q	0.014 Q	0.036	0.024 Q	0.095	**0.27**	**0.34 Z**	0.32	0.24 Z	*0.17*	0.059 Q	0.23	<0.0091	0.26	0.17	0.046	0.18	2.5
Dup (051607006)	05/16/2007	0.11	0.012 Q	0.016 Q	0.047	<0.012	0.020 Q	*0.049 Q*	*0.074 Z*	0.068	0.053 QZ	*0.039*	<0.019	0.055	<0.0091	0.058 Q	0.077	0.017 Q	0.042 Q	0.74
MW-13	04/11/2000	--	90	29	3.8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.0	<1.0	**2,000**	<1.0	<5.0	2,125
	03/27/2001	--	210	72	<5.0	<5.0	<2.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<2.0	**3,700**	<5.0	<5.0	3,982
	06/05/2002	<430 D	<450 D	<290 D	2.9	0.88 Q	2.4	**3.4**	**4.1**	2.9	2.6	**2.5**	0.63 Q	6.6	5.3	2.5	**3,800 C**	3.7	5.8	3,846
	05/15/2003	30 D*	0.77 Q*	18 D*	1.2 *	1.2 Q*	4.4	**6.2**	**6.0**	5.7	5.0	**5.1**	1.4	12 D*	2.1 *	4.5	1.6 *	4.3 *	9.7 *	119
	02/25/2004	Well was not accessible for sampling (bailer stuck in well)																		
	05/24/2004	55 D	24 D	17 Q, D	2.0	<0.38	1.4	**2.7**	**2.7**	2.7	1.9	**1.8**	0.72 Q	3.3	2.3	2.3	**140 D**	1.5	2.7	264
	05/18/2005	190 D	66 QD	51 QD	4.5 Q	<1.8	<2.0	<1.8	<1.8	<2.1 &	<1.9 &	<1.6 &	<2.2 &	2.0 Q	3.5 Q	<1.7 &	**920 D**	<2.0	<1.6	1,237
	05/30/2006	99	22	37	4.0 Q	<4.7	<6.4	<7.5	<6.4Z	<7.9	<7.9Z	<7.7	<7.7	<6.3	<3.7	<7.7	**51**	<4.6	<5.9	213
Dup (QC01)	05/30/2006	220	100	61	<16	<23	<31	<37	<31 Z	<39	<39 Z	<38	<38	<31	<18	<38	**860**	<23	<29	1,241
	05/16/2007	0.49 D	0.16	1.80 D	0.25	0.091	0.35	**0.69 D**	**0.69 DZ**	0.69 D	0.64 DZ	**0.48 D**	0.17	0.84 D	0.066	0.59 D	0.62 D	0.22	0.62 D	9.5

Table 2 - Groundwater Monitoring Well Analytical Results - PAHs
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 N. Tenth Street, Manitowoc, Wisconsin
USEPA ID# WIN000509949

Sample Location	Sample Date	1-Methyl-naphthalene	2-Methyl-naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a) anthracene	Benzo(a)pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene	Total PAHs
		POLYNUCLEAR AROMATIC HYDROCARBONS (µg/L)																		
Wisconsin Groundwater Quality Standards (NR 140)																				
Preventive Action Limit (PAL)		ns	ns	ns	ns	*600*	ns	*0.02*	*0.02*	ns	ns	*0.02*	ns	*80*	*80*	ns	*8*	ns	*50*	ns
Enforcement Standard (ES)		ns	ns	ns	ns	**3,000**	ns	**0.2**	**0.2**	ns	ns	**0.2**	ns	**400**	**400**	ns	**40**	ns	**250**	ns
MW-14	04/11/2000	--	140,000	3,300	36,000	**13,000**	9,500	**8,600**	**6,700**	4,500	7,700	**8,800**	1,200	**27,000**	**18,000**	4,000	**540,000**	45,000	**23,000**	896,300
	03/27/2001	--	140,000	3,300	45,000	**13,000**	10,000	**8,400**	**8,300**	3,300	<4,800	**7,400**	1,100	**28,000**	**15,000**	3,800	**510,000**	50,000	**24,000**	870,600
	06/05/2002	Not sampled due to product (DNAPL) being present.																		
	05/15/2003																			
	02/25/2004																			
	05/24/2004																			
	05/18/2005																			
	05/30/2006																			
	05/16/2007																			
MW-17T	04/11/2000	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	nd
	03/27/2001	--	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	nd
	06/05/2002	0.041 Q	0.045 Q	<0.018	<0.023	<0.020	<0.019	<0.012	<0.014	<0.015	<0.013	<0.018	<0.017	<0.028	<0.021	<0.014	0.49	<0.019	<0.020	0.6
	05/15/2003	<0.020 *	<0.019 *	<0.020 *	<0.021 *	0.022 *	<0.013	<0.016	<0.015	<0.018	<0.021	<0.016	<0.018	<0.015 *	<0.019 *	<0.024	<0.027 *	<0.018 *	<0.019 *	nd
	02/25/2004	0.021 Q	0.037 Q	<0.017	0.036 Q	0.053 Q	0.39	**0.70 D**	**1.0 D**	0.90 D	0.70 D	**0.73 D**	0.21	1.2 D	0.022 Q	0.73 D	0.56 D	0.28	0.88 D	8.4
	05/24/2004	<0.017	<0.016	<0.017	<0.018	<0.019	<0.011	<0.013	<0.012	<0.015	<0.018	<0.013	<0.015	<0.012	<0.016	<0.020	<0.023	<0.015	<0.016	nd
	05/18/2005	<0.02	<0.023	<0.019	<0.019	<0.018	<0.020	*0.030 Q*	*0.032 Q*	0.031 Q&	0.030 Q&	*0.026 Q&*	<0.022 &	0.037 Q	<0.022	0.024 Q&	0.046 Q	<0.02	0.033 Q	0.29
	05/30/2006	0.012 Q	0.017 QB	<0.0082	<0.0081	<0.012	<0.016	<0.018	0.019 QZ	<0.019	<0.019Z	<0.019	<0.019	0.025 Q	<0.0091	<0.019	0.013 QB	0.014 Q	0.020 Q	0.12
	05/16/2007	<0.010	<0.011	<0.0082	<0.0081	<0.012	<0.016	<0.018	<0.016 Z	<0.019	<0.019 Z	<0.019	<0.019	0.020 Q	<0.0091	<0.019	<0.012	<0.011	0.016 Q	0.04
MW-18T	04/11/2000	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	nd
	03/27/2001	--	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	nd
	06/05/2002	<0.027	<0.028	<0.018	<0.023	<0.020	<0.019	<0.012	<0.014	<0.015	<0.013	<0.018	<0.017	<0.028	<0.021	<0.014	0.12	<0.019	<0.020	0.1
	05/15/2003	<0.018	<0.017	<0.018	<0.019	<0.020	<0.012	<0.014	<0.013	<0.016	<0.019	<0.014	<0.016	<0.013	<0.017	<0.021	0.100	<0.016	<0.017	0.1
	02/25/2004	<0.017	<0.016	<0.017	<0.018	<0.019	<0.011	<0.013	<0.012	<0.015	<0.018	<0.013	<0.015	<0.012	<0.016	<0.020	0.028 Q	<0.015	<0.016	0.03
	05/24/2004	<0.017	<0.016	<0.017	<0.018	<0.019	<0.011	<0.013	<0.012	<0.015	<0.018	<0.013	<0.015	0.013 Q	<0.016	<0.020	<0.023	<0.015	<0.016	0.01
	05/18/2005	<0.02	<0.023	<0.019	<0.019	<0.018	<0.02	0.019 Q	*0.022 Q*	<0.021 &	<0.019 &	0.019 Q&	<0.022 &	0.030 Q	<0.022	<0.017 &	<0.022	<0.02	0.025 Q	0.12
	05/30/2006	0.036	0.013 QB	0.009 Q	<0.0081	<0.012	<0.016	<0.018	<0.016 Z	<0.019	<0.019 Z	<0.019	<0.019	<0.015	<0.0091	<0.019	0.029 QB	<0.011	<0.015	0.09
	05/16/2007	<0.010	<0.011	<0.0082	<0.0081	<0.012	<0.016	<0.018	<0.016 Z	<0.019	<0.019 Z	<0.019	<0.019	<0.015	<0.0091	<0.019	<0.012	<0.011	<0.015	nd

Table 2 - Groundwater Monitoring Well Analytical Results - PAHs
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 N. Tenth Street, Manitowoc, Wisconsin
USEPA ID# WIN000509949

Sample Location	Sample Date	1-Methyl-naphthalene	2-Methyl-naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a) anthracene	Benzo(a)pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene	Total PAHs
		POLYNUCLEAR AROMATIC HYDROCARBONS (µg/L)																		
Wisconsin Groundwater Quality Standards (NR 140)																				
Preventive Action Limit (PAL)		ns	ns	ns	ns	*600*	ns	*0.02*	*0.02*	ns	ns	*0.02*	ns	*80*	*80*	ns	*8*	ns	*50*	ns
Enforcement Standard (ES)		ns	ns	ns	ns	**3,000**	ns	**0.2**	**0.2**	ns	ns	**0.2**	ns	**400**	**400**	ns	**40**	ns	**250**	ns
MW-19T	04/11/2000	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	nd
	03/27/2001	--	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	nd
	06/05/2002	<0.16	<0.17	<0.11	0.30 Q	0.19 Q	0.86	**1.2**	**1.1**	0.92	0.71	**0.69**	0.29 Q	1.7	<0.13	0.91	0.44	0.44	1.4	11
	05/15/2003	<0.018 *	<0.017 *	<0.018 *	0.031 Q*	0.022 Q*	0.092	*0.16*	*0.17*	0.15	0.12	*0.12*	0.038 Q	0.19 *	<0.017 *	0.13	0.032 Q*I	0.060 *	0.18 *	1.5
	02/25/2004	<0.017	0.016 Q	<0.017	<0.018	<0.019	0.023 Q	*0.043 Q*	*0.059*	0.054	0.044 Q	*0.044 Q*	<0.015	0.070	<0.016	0.043 Q	0.12	0.020 Q	0.053 Q	0.6
	05/24/2004	0.019 Q	0.026 Q	<0.017	0.068	0.093	0.66 D	**1.5 D**	**2.1 D**	1.8 D	1.4 D	**1.5 D**	0.42	2.2 D	0.024 Q	1.5 D	0.045 Q	0.54 D	1.7 D	16
	05/18/2005	<0.02	<0.023	<0.019	0.040 Q	0.026 Q	0.10	*0.17*	**0.21**	0.20 &	0.16 &	*0.14 &*	0.041 Q&	0.24	<0.022	0.16 &	0.069 Q	0.075	0.2	1.8
	05/30/2006	0.018 Q	0.020 QB	<0.0082	0.029	0.017 Q	0.054	*0.098*	*0.12 Z*	0.11	0.088 Z	*0.075*	0.023 Q	0.13	<0.0091	0.086	0.25 B	0.039	0.11	1.3
	05/16/2007	<0.010	0.014 Q	<0.0082	0.016 Q	<0.012	0.019 Q	*0.039 Q*	*0.038 QZ*	0.042 Q	*0.033 QZ*	*0.028 Q*	<0.019	0.056	<0.0091	0.029 Q	0.034 Q	0.024 Q	0.046 Q	0.4
MW-20T	04/11/2000	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	nd
	03/27/2001	--	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	nd
	06/05/2002	<0.027	<0.028	<0.018	<0.023	<0.020	0.022 Q	*0.031 Q*	*0.033 Q*	0.029 Q	0.024 Q	*0.025 Q*	<0.017	0.061 Q	<0.021	0.026 Q	<0.027	0.027 Q	0.063 Q	0.3
	05/15/2003	0.053 Q	0.035 Q	<0.018	<0.019	<0.020	<0.012	0.018 Q	*0.025 Q*	0.023 Q	<0.019	*0.020 Q*	<0.016	0.032 Q	<0.017	<0.021	0.33	0.018 Q	0.028 Q	0.6
	02/25/2004	0.020 Q	0.030 Q	<0.017	0.042 Q	<0.019	0.039	*0.046*	*0.048*	0.040 Q	0.037 Q	*0.049*	<0.015	0.10	<0.016	0.032 Q	0.096	0.065	0.079	0.7
	05/24/2004	<0.017	<0.016	<0.017	0.019 Q	<0.019	0.078	*0.12*	*0.14*	0.12	0.10	*0.11*	0.031	0.21	<0.016	0.10	<0.023	0.078	0.18	1.3
	05/18/2005	<0.020	<0.023	<0.019	<0.019	<0.018	<0.020	*0.027 Q*	*0.035 Q*	0.029 Q	0.027 Q	*0.029 Q*	<0.022	0.046 Q	<0.022	0.022 Q	0.039 Q	0.023 Q	0.037 Q	0.3
	05/30/2006	<0.010	0.015 QB	<0.0082	<0.0081	<0.012	0.032 Q	*0.055 Q*	*0.053 Z*	0.051 Q	0.041 QZ	*0.044 Q*	<0.019	0.084	<0.0091	0.037 Q	<0.012	0.032 Q	0.064	0.5
Dup (QC02)	05/30/2006	0.017 Q	0.018 QB	<0.0082	0.014 Q	<0.012	0.028 Q	*0.052 Q*	*0.054 Z*	0.049 Q	0.037 QZ	*0.044 Q*	<0.019	0.087	0.016 Q	0.035 Q	0.064 B	0.043	0.06	0.6
	05/16/2007	<0.010	<0.011	<0.0082	<0.0081	<0.012	<0.016	<0.018	*0.023 QZ*	<0.019	0.020 QZ	*0.019 Q*	<0.019	0.037 Q	<0.0091	<0.019	<0.012	0.021 Q	0.026 Q	0.1
Dup (051607010)	05/16/2007	<0.010	<0.011	<0.0082	0.0086 Q	<0.012	0.020 Q	*0.038 Q **	*0.048 QZ**	0.038 Q*	0.038 QZ	*0.040 Q*	<0.019	0.071 *	<0.0091	0.036 Q *	<0.012	0.038 Q	0.051 *	0.4
MW-21T	04/11/2000	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	nd
	03/27/2001	--	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	nd
	06/05/2002	0.058 Q	<0.028	0.36	1.8 D	<0.020	0.027 Q	*0.10*	*0.073*	0.15	<0.047	*0.020 Q*	0.037 Q	0.031 Q	0.18	0.12	0.042 Q	0.035 Q	0.034 Q	3.1
	05/15/2003	0.037 Q	0.027 Q	0.082	0.47	<0.020	0.021 Q	*0.072*	*0.066*	0.11	0.046 Q	*0.030 Q*	0.020 Q	0.046	0.037 Q	0.081	0.18	0.022 Q	0.042 Q	1.4
	02/25/2004	0.032 Q	0.031 Q	0.25	1.1 D	<0.019	0.024 Q	*0.055*	*0.053*	0.068	0.047 Q	*0.037 Q*	<0.015	0.059	0.081	0.052 Q	0.76 D	0.034 Q	0.050 Q	2.7
	05/24/2004	0.018	0.022	0.025	0.066	0.053	0.37	**0.58**	**0.72**	0.63	0.59	**0.60**	0.17	1.0	0.026	0.54	0.038	0.35	0.82	6.6
	05/18/2005	0.030 Q	<0.023	0.180	0.75 D	<0.018	0.049 Q	*0.11*	*0.12*	0.15	0.11	*0.092*	0.031 Q	0.15	0.068 Q	0.11	0.049 Q	0.059 Q	0.11	2.2
	05/30/2006	<0.026	<0.029	<0.021	0.097	0.039 Q	0.14	**0.32**	**0.56 Z**	0.44	0.35 Z	**0.38**	0.078 Q	0.51	<0.023	0.34	<0.032	0.14	0.41	3.8
	05/16/2007	0.010 Q	0.013 Q	0.011 Q	0.10	0.016 Q	0.053	*0.13*	**0.21 Z**	0.18	0.14 Z	*0.13*	0.027 Q	0.18	0.012 Q	0.16	0.013 Q	0.054	0.15	1.6

[JTB/GRL-08/02][JTB/PAR-07/03][JKL-6/04][HMS/JAH -7/05][HMS/RJG 6/06][HMS/RJG 06/07]

Table 2 - Groundwater Monitoring Well Analytical Results - PAHs
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 N. Tenth Street, Manitowoc, Wisconsin
USEPA ID# WIN000509949

Sample Location	Sample Date	POLYNUCLEAR AROMATIC HYDROCARBONS (µg/L)																		
		1-Methyl-naphthalene	2-Methyl-naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a) anthracene	Benzo(a)pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene	Total PAHs
Wisconsin Groundwater Quality Standards (NR 140)																				
Preventive Action Limit (PAL)		ns	ns	ns	ns	*<u>600</u>*	ns	*<u>0.02</u>*	*<u>0.02</u>*	ns	ns	*<u>0.02</u>*	ns	*<u>80</u>*	*<u>80</u>*	ns	*<u>8</u>*	ns	*<u>50</u>*	ns
Enforcement Standard (ES)		ns	ns	ns	ns	**<u>3,000</u>**	ns	**<u>0.2</u>**	**<u>0.2</u>**	ns	ns	**<u>0.2</u>**	ns	**<u>400</u>**	**<u>400</u>**	ns	**<u>40</u>**	ns	**<u>250</u>**	ns

Notes:
1) Pre-2002 data from Horizon Environmental reports.
2) Concentrations that attain or exceed an NR 140 PAL are *<u>italicized/ underlined.</u>*
3) Concentrations that attain or exceed an NR 140 ES are **<u>underlined/ bold</u>**.
4) The 4/11/00 MW-13 sampling also contained: (22 µg/L 2,4-Dimethylphenol)(7.4 µg/L 2-methylphenol).
5) Wells PW-1 and MW-12 were buried by asphalt and well MW-1 was dry during the 5/15/03 sampling event.
PAHs: Polynuclear aromatic hydrocarbons.
ns: No standard for this analyte.
Dup (QC-1): Field duplicate sample (field identity shown in parentheses).
µg/L: Micrograms per liter.
-- : Analysis was not performed.
nd: Not detected.

Laboratory Notes:
Q: The analyte has been detected between the limit of detection (LOD) and limit of quantitation (LOQ).
C: Analyte value from diluted analysis, or surrogate result not applicable due to sample dilution.
I: Naphthalene present in blank at 0.030 µg/L.
*** :** Duplicate analysis not within control limits.
D: Analyte value from diluted analysis
&: Laboratory Control Spike recovery not within control limit.
Z: This compound was separated in the check standard but it did not meet the resolution criteria as set forth in SW846.
B: Analyte is present in the method blank.

Table 3 - Groundwater Elevations
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 N. Tenth Street, Manitowoc, Wisconsin
USEPA ID# WIN000509949

Well Name	**MW-1**		
Well Depth from TOC (feet)		23.71	
Screen Length (feet)		3	
Surface Elevation (MSL)		na	
Top of Casing Elevation (MSL)		601.06	
Top of Screen Elevation (MSL)		580.35	
Bottom of Screen Elevation (MSL)		577.35	
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	
03/22/1999	19.53	581.53	*
04/10/2000	Dry	< 577.35	
03/26/2001	20.65	580.41	*
10/25/2001	19.89	581.17	*
01/31/2002 A	inaccessible due to snow/ice		
03/03/2002	19.45	581.61	*
06/05/2002	19.32	581.74	*
05/15/2003	dry	dry	
08/26/2003	dry	dry	
11/19/2003	20.62	580.44	*
02/25/2004	20.67	580.39	*
05/24/2004	~23.7	~577.4	
11/10/2004	19.29	581.77	*
5/18/2005 G	19.32	581.74	*
11/28/2005	20.04	581.02	*
05/30/2006	19.68	581.38	*
05/16/2007	19.42	TBS	*

Well Name	**MW-2**		
Well Depth from TOC (feet)		23.75	
Screen Length (feet)		3	
Surface Elevation (MSL)		na	
Top of Casing Elevation (MSL)		597.18	
Top of Screen Elevation (MSL)		576.43	
Bottom of Screen Elevation (MSL)		573.43	
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	
03/22/1999	15.57	581.61	*
04/10/2000	16.61	580.57	*
03/26/2001	16.56	580.62	*
10/25/2001	15.95	581.23	*
01/31/2002 A	16.23	580.95	*
03/03/2002	inaccessible due to snow/ice		
06/05/2002	15.39	581.79	*
05/15/2003	16.35	580.83	*
08/26/2003	16.34	580.84	*
11/19/2003	16.74	580.44	*
02/25/2004	16.81	580.37	*
05/24/2004	15.64	581.54	*
11/10/2004	15.36	581.82	*
05/18/2005	15.43	581.75	*
11/28/2005	16.13	581.05	*
05/30/2006	15.75	581.43	*
05/16/2007	15.59	581.59	*

Well Name	**MW-5**		
Well Depth from TOC (feet)		29.20	
Screen Length (feet)		3	
Surface Elevation (MSL)		na	
Top of Casing Elevation (MSL)		605.24	
Top of Screen Elevation (MSL)		579.04	
Bottom of Screen Elevation (MSL)		576.04	
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	
03/22/1999	23.48	581.76	*
04/10/2000	24.51	580.73	*
03/26/2001	24.63	580.61	*
10/25/2001	23.86	581.38	*
01/31/2002 A	24.15	581.09	*
03/03/2002	inaccessible due to snow/ice		
06/05/2002	23.33	581.91	*
05/15/2003	24.31	580.93	*
08/26/2003	24.29	580.95	*
11/19/2003	24.86	580.38	*
02/25/2004	24.76	580.48	*
05/24/2004	23.70	581.54	*
11/10/2004	23.31	581.93	*
5/18/2005 G	22.98	582.26	*
11/28/2005	24.12	581.12	*
05/30/2006	23.75	581.49	*
05/16/2007	23.62	581.62	*

Well Name	**MW-6**		
Well Depth from TOC (feet)		30.55	
Screen Length (feet)		10	
Surface Elevation (MSL)		na	
Top of Casing Elevation (MSL)		601.85	
Top of Screen Elevation (MSL)		581.30	
Bottom of Screen Elevation (MSL)		571.30	
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	
03/22/1999	20.18	581.67	*
04/10/2000	21.23	580.62	
03/26/2001	21.34	580.51	
10/25/2001	20.56	581.29	
01/31/2002 A	inaccessible due to snow/ice		
03/03/2002	inaccessible due to snow/ice		
06/05/2002	20.03	581.82	*
05/15/2003	20.91	580.94	
08/26/2003	20.98	580.87	
11/19/2003	21.39	580.46	
02/25/2004	21.43	580.42	
05/24/2004	20.25	581.60	*
11/10/2004	19.9	581.95	*
05/18/2005	20.06	581.79	*
11/28/2005	20.83	581.02	
05/30/2006	20.33	581.52	*
05/16/2007	20.22	581.63	*

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Well Name	**MW-7**	
Well Depth from TOC (feet)		10.63
Screen Length (feet)		5
Surface Elevation (MSL)		na
Top of Casing Elevation (MSL)		588.93
Top of Screen Elevation (MSL)		583.30
Bottom of Screen Elevation (MSL)		578.30
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**
03/22/1999	7.30	581.63
04/10/2000	8.32	580.61
03/26/2001	8.43	580.50
10/25/2001	7.66	581.27
01/31/2003	nm	nm
03/03/2002	7.94	580.99
06/05/2002	7.14	581.79
05/15/2003	8.10	580.83
08/26/2003	8.07	580.86
11/19/2003	8.18	580.75
02/25/2004	8.52	580.41
05/24/2004	7.36	581.57
11/10/2004	7.08	581.85
05/18/2005	7.19	581.74
11/28/2005	7.88	581.05
05/30/2006	7.47	581.46
05/16/2007	7.36	581.57

Well Name	**MW-8**	
Well Depth from TOC (feet)		10.53
Screen Length (feet)		5
Surface Elevation (MSL)		na
Top of Casing Elevation (MSL)		588.13
Top of Screen Elevation (MSL)		582.60
Bottom of Screen Elevation (MSL)		577.60
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**
03/22/1999	6.58	581.55
04/10/2000	7.59	580.54
03/26/2001	7.70	580.43
10/25/2001	6.94	581.19
01/31/2003	nm	nm
03/03/2002	inaccessible due to snow/ice	
06/05/2002	6.75	581.38
05/15/2003	7.35	580.78
08/26/2003	7.32	580.81
11/19/2003	7.70	580.43
02/25/2004	inaccessible due to snow/ice	
05/24/2004	6.72	581.41
11/10/2004	5.16	582.97 *
05/18/2005	6.46	581.67
11/28/2005	7.03	581.10
05/30/2006	7.72	580.41
05/16/2007	7.10	581.03

Well Name	**MW-9**	
Well Depth from TOC (feet)		10.60
Screen Length (feet)		5
Surface Elevation (MSL)		na
Top of Casing Elevation (MSL)		588.60
Top of Screen Elevation (MSL)		583.00
Bottom of Screen Elevation (MSL)		578.00
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**
03/22/1999	6.99	581.61
04/10/2000	8.04	580.56
03/26/2001	8.14	580.46
10/25/2001	7.36	581.24
01/31/2002 A	7.65	580.95
02/15/2002 E	nm	nm
02/15/2002 B	nm	nm
02/15/2002 C	nm	nm
03/03/2002	7.66	580.94
06/05/2002	6.91	581.69
05/15/2003	7.83	580.77
08/26/2003	7.84	580.76
11/19/2003	8.46	580.14
02/25/2004	8.22	580.38
05/24/2004	7.10	581.50
11/10/2004	6.87	581.73
05/18/2005	6.92	581.68
11/28/2005	7.61	580.99
05/30/2006	7.25	581.35
05/16/2007	7.08	581.52

Well Name	**MW-10**	
Well Depth from TOC (feet)		14.51
Screen Length (feet)		5
Surface Elevation (MSL)		na
Top of Casing Elevation (MSL)		588.81
Top of Screen Elevation (MSL)		579.30
Bottom of Screen Elevation (MSL)		574.30
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**
03/22/1999	7.22	581.59 *
04/10/2000	8.27	580.54 *
03/26/2001	8.39	580.42 *
10/25/2001	7.66	581.15 *
01/31/2002 A	7.87	580.94 *
02/15/2002 E	7.94	580.87 *
02/15/2002 B	7.97	580.84 *
02/15/2002 C	7.97	580.84 *
03/03/2002	7.89	580.92 *
06/05/2002	7.09	581.72 *
05/15/2003	7.95	580.86 *
08/26/2003	7.96	580.85 *
11/19/2003	8.37	580.44 *
02/25/2004	8.50	580.31 *
05/24/2004	7.31	581.50 *
11/10/2004	6.95	581.86 *
05/18/2005	7.07	581.74 *
11/28/2005	7.68	581.13 *
05/30/2006	7.31	581.5 *
05/16/2007	7.19	581.62 *

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Well Name	**MW-11**		
Well Depth from TOC (feet)		14.64	
Screen Length (feet)		5	
Surface Elevation (MSL)		na	
Top of Casing Elevation (MSL)		588.94	
Top of Screen Elevation (MSL)		579.30	
Bottom of Screen Elevation (MSL)		574.30	
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	
03/22/1999	7.34	581.6	*
04/10/2000	8.38	580.56	*
03/26/2001	8.48	580.46	*
10/25/2001	7.70	581.24	*
01/31/2002 A	7.96	580.98	*
02/15/2002 E	nm	nm	
02/15/2002 B	nm	nm	
02/15/2002 C	nm	nm	
03/03/2002	7.94	581.00	*
06/05/2002	8.03	580.91	*
05/15/2003	8.11	580.83	*
08/26/2003	8.08	580.86	*
11/19/2003	8.48	580.46	*
02/25/2004	8.48	580.46	*
05/24/2004	7.39	581.55	*
11/10/2004	7.30	581.64	*
05/18/2005	7.27	581.67	*
11/28/2005	8.34	580.60	*
05/30/2006	**Abandoned**		

Well Name	**MW-12**	
Well Depth from TOC (feet)		13.60
Screen Length (feet)		5
Surface Elevation (MSL)		na
Top of Casing Elevation (MSL)		590.40
Top of Screen Elevation (MSL)		581.80
Bottom of Screen Elevation (MSL)		576.80
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**
03/22/1999	10.35	580.05
04/10/2000	11.43	578.97
03/26/2001	11.72	578.68
10/25/2001	10.63	579.77
01/31/2002 A	10.51	579.89
02/15/2002 E	9.87	580.53
02/15/2002 B	11.25	579.15
02/15/2002 C	10.91	579.49
03/03/2002	10.20	580.20
06/05/2002	8.80	581.60
05/15/2003	inaccessible (covered with asphalt)	
08/26/2003	10.10	580.30
11/19/2003	11.31	579.09
02/25/2004	11.51	578.89
05/24/2004	9.42	580.98
11/10/2004	9.00	581.4
05/18/2005	10.39	580.01
11/28/2005	10.1	580.3
05/30/2006	nm	nm
06/20/2006	9.85	580.55
05/16/2007	10.28	580.12

Well Name	**MW-12D**		
Well Depth from TOC (feet)		35.02	
Screen Length (feet)		15	
Surface Elevation (MSL)		na	
Top of Casing Elevation (MSL)		590.62	
Top of Screen Elevation (MSL)		570.60	
Bottom of Screen Elevation (MSL)		555.60	
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	
03/22/1999	10.81	579.81	*
04/10/2000	11.82	578.80	*
03/26/2001	12.10	578.52	*
10/25/2001	10.94	579.68	*
01/31/2002 A	10.79	579.83	*
02/15/2002 E	10.10	580.52	*
02/15/2002 B	11.89	578.73	*
02/15/2002 C	11.40	579.22	*
03/03/2002	10.43	580.19	*
06/05/2002	9.06	581.56	*
05/15/2003	11.26	579.36	*
08/26/2003	10.38	580.24	*
11/19/2003	11.66	578.96	*
02/25/2004	inaccessible, well under melt water		
05/24/2004	9.81	580.81	*
11/10/2004	9.35	581.27	*
05/18/2005	10.74	579.88	*
11/28/2005	10.55	580.07	*
05/30/2006	9.23	581.39	*
05/16/2007	11.60	579.02	*

Well Name	**MW-13**	
Well Depth from TOC (feet)		12.53
Screen Length (feet)		5
Surface Elevation (MSL)		na
Top of Casing Elevation (MSL)		590.93
Top of Screen Elevation (MSL)		583.40
Bottom of Screen Elevation (MSL)		578.40
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**
03/22/1999	10.48	580.45
04/10/2000	11.60	579.33
03/26/2001	11.84	579.09
10/25/2001	10.85	580.08
01/31/2002 A	10.85	580.08
02/15/2002 E	10.33	580.60
02/15/2002 B	10.99	579.94
02/15/2002 C	10.93	580.00
03/03/2002	10.70	580.23
06/05/2002	9.39	581.54
05/15/2003	10.96	579.97
08/26/2003	10.66	580.27
11/19/2003	> 8.53	na
02/25/2004	>8.53	na
05/24/2004	9.74	581.19
11/10/2004	9.60	581.33
05/18/2005	10.51	580.42
11/28/2005	10.46	580.47
05/30/2006	9.53	581.40
05/16/2007	11.45	579.48

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Well Name	**MW-14**	
Well Depth from TOC (feet)		17.57
Screen Length (feet)		5
Surface Elevation (MSL)		na
Top of Casing Elevation (MSL)		594.87
Top of Screen Elevation (MSL)		582.30
Bottom of Screen Elevation (MSL)		577.30
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**
03/22/1999	13.69	581.18
04/10/2000	14.74	580.13
03/26/2001	14.87	580.00
10/25/2001	14.06	580.81
01/31/2002 A,P	14.26	580.61
02/15/2002 E,P	14.08	580.79
02/15/2002 B,P	14.26	580.61
02/15/2002 C,P	14.29	580.58
03/03/2002 P	14.19	580.68
06/05/2002 P	nm	nm
05/15/2003 P	14.50	580.37
08/26/2003 P	nm	nm
11/19/2003 P	15.32	579.55
2/25/2004 P	14.83	580.04
5/24/2004 P	13.10	581.77
11/10/2004	nm	nm
5/18/2005 P	nm	nm
11/28/2005 P	14.04	580.83
5/30/2006 P	13.45	581.42
5/16/2007 P	13.80	581.07

Well Name	**MW-15T**	
Well Depth from TOC (feet)		20.0
Screen Length (feet)		15
Surface Elevation (MSL)		na
Top of Casing Elevation (MSL)		586.75
Top of Screen Elevation (MSL)		581.75
Bottom of Screen Elevation (MSL)		566.75
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**
11/19/2003	nm	nm
02/25/2004	nm	nm
05/24/2004	nm	nm
11/10/2004	nm	nm
05/18/2005	6.73	580.02
11/28/2005	7.02	579.73
05/30/2006	6.17	580.58
5/16/2007	6.57	580.18

Well Name	**MW-16T**	
Well Depth from TOC (feet)		17.5
Screen Length (feet)		15
Surface Elevation (MSL)		na
Top of Casing Elevation (MSL)		586.74
Top of Screen Elevation (MSL)		584.24
Bottom of Screen Elevation (MSL)		569.24
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**
11/19/2003	6.89	579.85
02/25/2004	7.48	579.26
05/24/2004	4.26	582.48
11/10/2004	5.93	580.81
05/18/2005	6.16	580.58
11/28/2005	6.08	580.66
05/30/2006	nm	nm
5/16/2007	5.88	580.86

Well Name	**MW-17T**	
Well Depth from TOC (feet)		23.96
Screen Length (feet)		15
Surface Elevation (MSL)		na
Top of Casing Elevation (MSL)		594.81
Top of Screen Elevation (MSL)		585.85
Bottom of Screen Elevation (MSL)		570.85
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**
03/22/1999	14.09	580.72
04/10/2000	15.24	579.57
03/26/2001	na	na
10/25/2001	14.54	580.27
01/31/2002 A	14.65	580.16
02/15/2002 E	14.29	580.52
02/15/2002 B	14.91	579.90
02/15/2002 C	14.81	580.00
03/03/2002	inaccessible due to snow/ice	
06/05/2002	13.14	581.67
05/15/2003	14.74	580.07
08/26/2003	14.54	580.27
11/19/2003	15.27	579.54
02/25/2004	15.40	579.41
05/24/2004	13.48	581.33
11/10/2004	13.49	581.32
05/18/2005	14.23	580.58
11/28/2005	14.35	580.46
05/30/2006	13.54	581.27
05/16/2007	14.20	580.61

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Well Name	**MW-18T**		
Well Depth from TOC (feet)		26.56	
Screen Length (feet)		15	
Surface Elevation (MSL)		na	
Top of Casing Elevation (MSL)		597.85	
Top of Screen Elevation (MSL)		586.29	
Bottom of Screen Elevation (MSL)		571.29	
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	
03/22/1999	16.28	581.57	
04/10/2000	17.30	580.55	
03/26/2001	17.44	580.41	
10/25/2001	16.66	581.19	
01/31/2002 A	nm	nm	
02/15/2002 E	nm	nm	
02/15/2002 B	nm	nm	
02/15/2002 C	nm	nm	
03/03/2002	16.92	580.93	
06/05/2002	16.08	581.77	
05/15/2003	16.96	580.89	
08/26/2003	17.05	580.80	
11/19/2003	17.47	580.38	
02/25/2004	17.98	579.87	
05/24/2004	16.34	581.51	
11/10/2004	16.13	581.72	
05/18/2005	16.20	581.65	
11/28/2005	16.88	580.97	
05/30/2006	16.50	581.35	
05/16/2007	16.36	581.49	

Well Name	**MW-19T**		
Well Depth from TOC (feet)		40.00	
Screen Length (feet)		15	
Surface Elevation (MSL)		na	
Top of Casing Elevation (MSL)		594.50	
Top of Screen Elevation (MSL)		569.50	
Bottom of Screen Elevation (MSL)		554.50	
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	
03/22/1999	13.90	580.60	*
04/10/2000	15.03	579.47	*
03/26/2001	15.22	579.28	*
10/25/2001	14.28	580.22	*
01/31/2002 A	inaccessible due to snow/ice		
02/15/2002 E	13.91	580.59	*
02/15/2002 B	14.74	579.76	*
02/15/2002 C	14.58	579.92	*
03/03/2002	14.14	580.36	*
06/05/2002	12.79	581.71	*
05/15/2003	14.46	580.04	*
08/26/2003	14.11	580.39	*
11/19/2003	14.95	579.55	*
02/25/2004	14.98	579.52	*
05/24/2004	12.23	582.27	*
11/10/2004	nm	nm	
05/18/2005	13.90	580.60	*
11/28/2005	14.35	580.15	*
05/30/2006	13.06	581.44	*
05/16/2007	13.83	580.67	*

Well Name	**MW-20T**		
Well Depth from TOC (feet)		39.72	
Screen Length (feet)		15	
Surface Elevation (MSL)		na	
Top of Casing Elevation (MSL)		596.13	
Top of Screen Elevation (MSL)		571.41	
Bottom of Screen Elevation (MSL)		556.41	
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	
03/22/1999	14.73	581.40	*
04/10/2000	15.74	580.39	*
03/26/2001	15.95	580.18	*
10/25/2001	15.10	581.03	*
01/31/2002	nm	nm	
01/31/2002 A	nm	nm	
02/15/2002 E	nm	nm	
02/15/2002 B	nm	nm	
02/15/2002 C	nm	nm	
03/03/2002	15.32	580.81	*
06/05/2002	14.39	581.74	*
05/15/2003	15.47	580.66	*
08/26/2003	15.49	580.64	*
11/19/2003	15.84	580.29	*
02/25/2004	15.95	580.18	*
05/24/2004	14.63	581.50	*
11/10/2004	14.48	581.65	*
05/18/2005	14.58	581.55	*
11/28/2005	15.20	580.93	*
05/30/2006	20.73	575.4	*
05/16/2007	14.68	581.45	*

Well Name	**MW-21T**		
Well Depth from TOC (feet)		40.00	
Screen Length (feet)		15	
Surface Elevation (MSL)		na	
Top of Casing Elevation (MSL)		596.99	
Top of Screen Elevation (MSL)		571.99	
Bottom of Screen Elevation (MSL)		556.99	
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	
03/22/1999	15.44	581.55	*
04/10/2000	16.48	580.51	*
03/26/2001	16.57	580.42	*
10/25/2001	15.84	581.15	*
01/31/2002	nm	nm	
01/31/2002 A	16.10	580.89	*
02/15/2002 E	nm	nm	
02/15/2002 B	nm	nm	
02/15/2002 C	nm	nm	
03/03/2002	16.08	580.91	*
06/05/2002	15.25	581.74	*
05/15/2003	16.22	580.77	*
08/26/2003	16.26	580.73	*
11/19/2003	16.57	580.42	*
02/25/2004	16.68	580.31	*
05/24/2004	15.50	581.49	*
11/10/2004	15.21	581.78	*
05/18/2005	15.31	581.68	*
11/28/2005	13.93	583.06	*
05/30/2006	15.6	581.39	*
05/16/2007	15.33	581.66	*

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River Staff Gauge		
Top of Gauge (4/13/98) Elevation (MSL)		585.88
Top of Gauge (5/24/05) Elevation (MSL)		585.33
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**
04/13/1998	4.70	581.18
03/22/1999	7.28	578.60
04/10/2000	8.41	577.47
03/26/2001 D	8.35	577.53
10/25/2001	nm	nm
01/31/2002 E	nm	nm
01/31/2002 A	nm	nm
02/15/2002 E	nm	nm
02/15/2002 B	nm	nm
02/15/2002 C	nm	nm
03/03/2002	nm	nm
06/05/2002	nm	nm
05/15/2003	nm	nm
08/26/2003	nm	nm
11/19/2003	nm	nm
02/25/2004	nm	nm
05/24/2004	nm	nm
11/10/2004	nm	nm
05/24/2005	6.72	578.61
11/28/2005	7.34	577.99
05/30/2006	6.83	578.50
06/20/2006	7.19	578.14
05/16/2007	7.05	578.28

Well Name		**PW-1**	
Well Depth from TOC (feet)		35.00	
Screen Length (feet)		15	
Surface Elevation (MSL)		na	
Top of Casing Elevation (MSL)		590.40	
Top of Screen Elevation (MSL)		570.40	
Bottom of Screen Elevation (MSL)		555.40	
Date	**Depth to Water from TOC (feet)**	**Water Elevation (MSL)**	
04/13/1998	15.05	575.35	*
03/22/1999	15.00	575.40	*
04/10/2000	16.76	573.64	*
03/26/2001	19.38	571.02	*
10/25/2001	16.41	573.99	*
01/31/2002 E	10.21	580.19	*
01/31/2002 A	14.05	576.35	*
02/15/2002 E	9.90	580.50	*
02/15/2002 B	26.93	563.47	
02/15/2002 C	19.52	570.88	*
03/03/2002 E	10.19	580.21	*
06/05/2002	18.52	571.88	*
05/15/2003	inaccessible (covered with asphalt)		
08/26/2003	inaccessible (covered with asphalt)		
11/19/2003 F	18.25	572.15	*
02/25/2004	20.81	569.59	
05/24/2004	16.25	574.15	*
11/10/2004	nm	nm	
05/18/2005	nm	nm	
11/28/2005	13.54	576.86	*
5/30/2006 E	9.04	581.36	*
05/16/2007	16.32	574.08	*

[JTB/AAS 06/25/02][U-JTB/C-PAR 7/03][U-JKY/C-JTB-5/04][U-HMS/JAH 050711][HMS/RJG 6/06][HMS/RJG 6/07]

Notes:
1) Well construction and pre-2002 water level data collected from Horizon Environmental reports.
A: Pump operating at 5 GPM
B: Pump operating at 27.5 GPM
C: Pump operating at 15.5 GPM
D: River was covered with 6-12 inches of ice.
E: Pump off or suspected to be off
F: Pump operating at 11 GPM
G: Bailer had to be removed to obtain water level
P: Product (DNAPL) present in well

TOC: top of well casing
TOG: top of staff gauge
***:** Water elevation above top of screen.
MSL: mean sea level
na: not available
nm: not measured
TBS: To be surveyed in June 2007 bases on new top of casing elevation

Table 4 - Sampling and Analysis Plan Summary
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street, Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Type/Location	Proposed Number of Sampling Locations	Matrix / Laboratory	Parameter	Method	Estimated Sample Quantity	Field Duplicates [2]	Equipment Blanks [3]	MS/MSD [4]	TOTAL	Container Type	Minimum Volume	Preservation (Cool to 4° ≥ 2°C All Samples)	Holding Time from Sample Date
UPLAND													
Surface Soil	14	soil	PVOCs	8021or 8260B	14	1	0	1	16	glass vial	2 oz.	methanol	7/28 days
(Human health risk	(1 sample per	fixed or	PAHs	8270C or 8270-SIM	14	1	0	1	16	amber glass	4 oz.		14/40 days
assessment - 0 to 2 ft bgs	location)	mobile	Lead	6020A	14	1	0	1	16	plastic	5 oz.		6 mo.
and Feasibility Study)			Vanadium	6020A	14	1	0	1	16	plastic	5 oz.		6 mo.
		fixed	Total Cyanide	9012A	14	1	0	1	16	plastic	5 oz.		14 days
Subsurface Soil	26	soil	PVOCs	8021or 8260B	up to 78	up to 4	0	up to 4	up to 86	glass vial	2 oz.	methanol	7/28 days
(Human health risk	(up to 3	fixed or	PAHs	8270C or 8270-SIM	up to 78	up to 4	0	up to 4	up to 86	amber glass	4 oz.		14/40 days
assessment and	samples	mobile	Lead	6020A	up to 78	up to 4	0	up to 4	up to 86	plastic	5 oz.		6 mo.
Feasibility Study)	per location)		Vanadium	6020A	up to 78	up to 4	0	up to 4	up to 86	plastic	5 oz.		6 mo.
		fixed	Total Cyanide	9012A	up to 78	up to 4	0	up to 4	up to 86	plastic	5 oz.		14 days
Subsurface Soil	2	soil	Grain Size Distribution	ASTM D421/D422	2	0	0	0	2	5 gal bucket	5 gal		
(Soil Vapor Assessment,	(1 location near	fixed	Moisture Content	ASTM D2216	2	0	0	0	2	from 5 gal bucket			
exterior building samples)	each building)		Bulk Density	ASTM D2937	2	0	0	0	2	Undisturbed Sample	Shelby		
			Specific Gravity of Soil Solids	ASTM D854	2	0	0	0	2	from Shelby			
Soil		soil	Protocol B	various	1 Composite	0	0	0	1	glass	26 oz.		varies
(Waste Characterization)		fixed											
Soil Vapor	TBD	soil vapor	BTEX + Naphthalene	TO-15	TBD	TBD	0	0	TBD	≤1-L Summa canister			30 days
(Human health risk	(2 samples per	fixed	Oxygen	ASTM D1946 or EPA 3C	TBD	TBD	0	0	TBD	≤1-L Summa canister			30 days
assessment - Indoor Air	location)		Carbon Dioxide	ASTM D1946 or EPA 3C	TBD	TBD	0	0	TBD	≤1-L Summa canister			30 days
Pathway)			Methane	ASTM D1946 or EPA 3C	TBD	TBD	0	0	TBD	≤1-L Summa canister			30 days
Groundwater Grab Samples	3	water	PVOCs	8021or 8260B	3	1	0	0	4	glass vial	2-40 ml	HCl to pH<2, Zero Headspace	14 days
(Feasibility Study)	(1 sample per	mobile	PAHs	8270C or 8270-SIM	3	1	0	0	4	amber glass	2 liters		14 days
	location)												
Groundwater - wells [1]	26	water	PVOCs	8021or 8260B	26	3	0	2	31	glass vial	2-40 ml	HCl to pH<2, Zero Headspace	14 days
(Risk Assessment, Feasibility		fixed	PAHs	8270C or 8270-SIM	26	3	0	2	31	amber glass	2 liters		14 days
Study, On-going monitoring)			Metals[15] (Min. One Round)	6020A	26	3	0	2	31	glass	1 liter	H2SO4 to pH<2	
			Avail. Cyanide (Min. One Round)	OIA-1677	26	3	0	2	31	amber glass	500 ml	PbCO3; NaOH to pH>12	14 days
			Field Parameters[8]	Field	26	0	0	0	26	field measured			
Influent - Treatment System	1	water	VOCs	8260B	2/year	0	0	0	2/year	glass vial	2-40 ml	HCl to pH<2, Zero Headspace	14 days
		fixed	PAHs	8270C or 8270-SIM	2/year	0	0	0	2/year	amber glass	2 liters		14 days
Intermediate (Between Carbon)	1	water	BTEX	8021or 8260B	Bimonthly	0	0	0	Bimonthly	glass vial	2-40 ml	HCl to pH<2, Zero Headspace	14 days
		fixed											
Effluent - Treatment System	1	water	VOCs	8260B	2/year	0	0	0	2/year	glass vial	2-40 ml	HCl to pH<2, Zero Headspace	14 days
		fixed	SVOCs	8270C or 8270-SIM	2/year	0	0	0	2/year	amber glass	2 liters		14 days
			pH	150.1	2/year	0	0	0	2/year	plastic	250 ml		immediate

Table 4 - Sampling and Analysis Plan Summary

Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street, Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Type/Location	Proposed Number of Sampling Locations	Matrix / Laboratory	Parameter	Method	Estimated Sample Quantity	Field Duplicates[2]	Equipment Blanks[3]	MS/MSD[4]	TOTAL	Container Type	Minimum Volume	Preservation (Cool to 4° ≥ 2°C All Samples)	Holding Time from Sample Date
SEDIMENT SAMPLING STEP I													
River Surface Water (Human Health and Ecological Risk Assessment)	9 (1 sample per location)	water fixed	PVOCs	8021or 8260B	9	1	0	1	11	glass vial	2-40 ml	HCl to pH<2, Zero Headspace	14 days
			PAHs	8270C or 8270-SIM	9	1	0	1	11	amber glass	2 liters		14 days
			Metals[10]	6020A	9	1	0	1	11	plastic	500 ml	HNO3 to pH <2	28 days
			Cyanide	OIA-1677	9	1	0	1	11	amber glass	500 ml	PbCO3; NaOH to pH>12	14 days
			Phenols[12]	8270C	9	1	0	1	11	amber glass	1 L		14 days
			Total Suspended Solids	160.2	9	1	0	1	11	plastic	250 ml		7 days
			Field Parameters[8]	Field	9	0	0	0	9	field measured			
River Sediment (Ecological Risk Assessment)	TBD (min. 23)	sediment mobile	PVOCs	8021or 8260B	TBD	TBD	TBD	TBD	TBD	glass	2 oz.	methanol	7/28 days
			34 PAHs[5]	8270C or 8270-SIM	TBD	TBD	TBD	TBD	TBD	amber glass	4 oz.		14/40 days
			Metals[9]	6020A	TBD	TBD	TBD	TBD	TBD	plastic	125 mL		6 months
			Phenols[12]	8270C	TBD	TBD	TBD	TBD	TBD	amber glass	8 oz.		14/40 days
			Percent Solids	Various	TBD	TBD	TBD	TBD	TBD	glass	4 oz.	keep in dark	28 days
		fixed	Cyanide	9012A	23	2	0	0	25	plastic	125 mL		14 days
			Black Carbon[6]	Refer to Note 6	23	2	0	0	25	plastic	500 g	keep in dark	28 days
			TOC	Various	23	2	0	0	25	plastic	100 g	keep in dark	28 days
			Toxicity Testing[7]	Refer to Note 7	23	2	0	0	25	plastic	2L	keep in dark	
			Ammonia	350.1	23	2	0	0	25	plastic	10 g		28 days
			Total Sulfide	9030	23	2	0	0	25	amber glass	25g min	Zero Headspace	7 days
River Sediment (Human Health Risk Assessment)	3 cores (1 sample per location)	sediment mobile	PVOCs	8021or 8260B	3	1	0	0	4	glass	2 oz.	methanol	7/28 days
			PAHs	8270C or 8270-SIM	3	1	0	0	4	amber glass	4 oz.		14/40 days
			Percent Solids	Various	3	1	0	0	4	glass	4 oz.	keep in dark	28 days
		fixed	TOC	Various	3	1	0	0	4	plastic	100 g	keep in dark	28 days
SEDIMENT SAMPLING STEP II													
River Surface Water (if needed) (Human Health and Ecological Risk Assessment)	Locations and parameters as needed	water fixed	PVOCs	8021or 8260B	TBD	TBD	TBD	TBD	TBD	glass vial	2-40 ml	HCl to pH<2, Zero Headspace	14 days
			PAHs	8270C or 8270-SIM	TBD	TBD	TBD	TBD	TBD	amber glass	2 liters		14 days
			Metals[10]	6020A	TBD	TBD	TBD	TBD	TBD	plastic	500 ml	HNO3 to pH <2	28 days
			Cyanide	OIA-1677	TBD	TBD	TBD	TBD	TBD	amber glass	500 ml	PbCO3; NaOH to pH>12	14 days
			Phenols[12]	8270C	TBD	TBD	TBD	TBD	TBD	amber glass	1 L		14 days
			Total Suspended Solids	EPA 160.2	TBD	TBD	TBD	TBD	TBD	plastic	250 ml		7 days
			Field Parameters[8]	Field	TBD	TBD	TBD	TBD	TBD	field measured			
River Sediment (Characterization)	32 cores	sediment TBD/fixed	COCs[13]	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
			TOC	Various	TBD	TBD	TBD	TBD	TBD	plastic	100 g	keep in dark	28 days
			Black Carbon[6]	Refer to Note 6	TBD	TBD	TBD	TBD	TBD	plastic	500 g	keep in dark	28 days
River Sediment (Waste and Geotechnical Characterization)	4 cores (included in above 32 cores)	sediment fixed	Protocol B	Various	1 Composite	0	0	0	TBD	glass	26 oz.		varies
			Grain Size Distribution	ASTM D421, 422	TBD	0	0	0	TBD	5 gal bucket	5 gal.		
			Atterberg Limits	ASTM D4318	TBD	0	0	0	TBD	Glass or Plastic	8 oz.		
			Organic Content	ASTM D2974	TBD	0	0	0	TBD	plastic	100 g	keep in dark	28 days
			Specific Gravity	ASTM D854	TBD	0	0	0	TBD	plastic	200 g		
			Moisture Content	ASTM D2216	TBD	0	0	0	TBD	Glass or Plastic	8 oz.		
			Shear Strength	pocket penetrometer/torvane	TBD	0	0	0	TBD	field measured			
River Sediment (NR 347 Parameters)	3 cores (included in above 32 cores)	sediment fixed	PCB (total)	8082	TBD	0	0	0	TBD	amber glass	250 g		14 days
			Pesticides[14]	8081A	TBD	0	0	0	TBD	amber glass	250 g		14 days
			Metals[11]	6020A	TBD	0	0	0	TBD	plastic	100 g		6 months
			Oil & Grease	9070	TBD	0	0	0	TBD	amber glass	30 g		28 days
			Nitrate+Nitrite	LACHAT 12-107-04-1-B (0.25)	TBD	0	0	0	TBD	plastic	30 g		28 days
			Ammonia-Nitrogen	LACHAT 12-107-06-1-A (0.16)	TBD	0	0	0	TBD	plastic	3 g		28 days
			Total Kjeldahl Nitrogen	LACHAT 10-107-06-2-E	TBD	0	0	0	TBD	plastic	3 g		28 days
			Total Phosphorus	365.2 or 365.3	TBD	0	0	0	TBD	plastic	3 g		28 days
			Percent Solids	Various	TBD	0	0	0	TBD	glass	4 oz	keep in dark	28 days
			TOC	Various	TBD	0	0	0	TBD	plastic	100 g	keep in dark	28 days

Table 4 - Sampling and Analysis Plan Summary
Wisconsin Public Service - Former Manitowoc Manufactured Gas Plant Site
402 North Tenth Street, Manitowoc, Wisconsin
USEPA WIN000509949 / BRRTS # 02-36-000219

Sample Type/Location	Proposed Number of Sampling Locations	Matrix / Laboratory	Parameter	Method	Estimated Sample Quantity	Field Duplicates [2]	Equipment Blanks [3]	MS/MSD [4]	TOTAL	Container Type	Minimum Volume	Preservation (Cool to 4° ≥ 2°C All Samples)	Holding Time from Sample Date

Notes:
1. Groundwater monitoring will be quarterly for one year following new well installation including 19 existing wells and up to 7 anticipated new wells.
2. Field duplicates will be collected at a frequency of one per group of ten or fewer investigative water samples and one per group of twenty or fewer investigative soil/soil vapor samples.
3. Equipment blanks will be collected at a frequency of one per sampling day with non-dedicated sampling equipment.
4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples will be collected at a frequency of one per group of twenty or fewer investigative samples. Additional volume will be determined per laboratory requirements.
5. Includes a list of 34 PAHs, including chain parameters as provided in USEPA Guidance Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures, 2002 by SW-846 Method 8270C with gas chromatograph/mass spectrometry in selected ion mode of operation.
6. Black Carbon ("Soot" Carbon) is the remaining carbon after muffle furnace drying and acid treatment of sediments to remove other forms of carbon. Used to estimate the bioavailable concentration of PAHs in sediment from the "freely-dissolved" chemical in the interstitial water based on USEPA Bioavailability Procedure, 2000, Gustafsson, et al. 1997, and Accardi-Day and Gschwend, 2003.
7. The *Hyalella* (amphipod) 28-day test will be used to evaluate the toxicity of whole sediments. This test will be performed in accordance with USEPA.
8. Field parameters include temperature, pH, specific conductivity, oxidation-reduction potential, and dissolved oxygen. Also includes turbidity for surface water samples.
9. Metals analyses for Step I sediment sampling include: aluminum, antimony, barium, copper, iron, lead, manganese, nickel, selenium, silver, vanadium, and zinc.
10. Metals analyses for Surface Water risk assesment include: aluminum, antimony, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, vanadium, and zinc.
11. Metals analyses for NR 347 include: arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium and zinc.
12. Phenols include 2,4-dimethylphenol, 2-methylphenol, 4-methylphenol and phenol.
13. COCs will be determined after interpretation of the results of the Step I risk assesment
14. Pesticides for NR 347 include: chlordane, DDT, and DDD & DDE.
15. Metals analyses for groundwater monitoring include: aluminum, iron, manganese, and vanadium. If results of first round indicate concentrations below screening values, then parameters will be discontinued.

Acronyms:
PCB = Polychlorinated Biphenyl
TBD = To be determined based on field encountered conditions
BTEX = Benzene, toluene, ethylbenzene, and xylenes
PVOC = Petroleum Volatile Organic Compounds
TOC = Total Organic Carbon
VOC = Volatile Organic Compounds
PAHs = Polynuclear Aromatic Hydrocarbons
SVOCs = Semi-volatile organic compounds
COCs = Contaminants of concern

APPENDIX A

HISTORICAL STRUCTURES MAPS

APPENDIX A1

SANBORN MAPS

EDR® Environmental Data Resources Inc

"Linking Technology with Tradition"®

Sanborn® Map Report

Ship To: Brian Hennings
Natural Resource
23713 W. Paul Road
Pewaukee, WI 53072

Order Date: 1/9/2007 **Completion Date:** 1/10/2007
Inquiry #: 1831689.3s
P.O. #: NA
Site Name: Former Wisconsin Fuel and Light
Address: North 11th Street/Chicago Street
City/State: Manitowoc, WI 54220
Cross Streets:

Customer Project: 1530
1017571CAR 262-523-9000

Based on client-supplied information, fire insurance maps for the following years were identified

1883 - 2 Maps
1887 - 2 Maps
1894 - 2 Maps
1900 - 3 Maps
1906 - 2 Maps
1912 - 2 Maps
1919 - 3 Maps
1927 - 3 Maps
1946 - 3 Maps
1956 - 3 Maps
1964 - 3 Maps
1966 - 3 Maps

Limited Permission to Photocopy Total Maps: 31

Natural Resource Technology (the client) is permitted to make up to THREE photocopies of this Sanborn Map transmittal and each fire insurance map accompanying this report solely for the limited use of its customer. No one other than the client is authorized to make copies. Upon request made directly to an EDR Account Executive, the client may be permitted to make a limited number of additional photocopies. This permission is conditioned upon compliance by the client, its customer and their agents with EDR's copyright policy; a copy of which is available upon request.

USER'S GUIDE

This User's Guide provides guidelines for accessing Sanborn Map® images and for transferring them to your Word Processor.

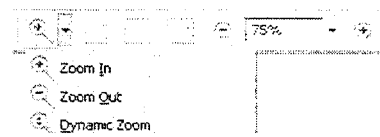
Reading Sanborn Maps

- Sanborn Maps document historical property use by displaying property information through words, abbreviations, and map symbols. The Sanborn Map Key provides information to help interpret the symbols and abbreviations used on Sanborn Maps. The Key is available from EDR's Web Site at: http://www.edrnet.com/reports/samples/key.pdf

Organization of Electronic Sanborn Image File

- Sanborn Map Report, listing years of coverage
- User's Guide
- Oldest Sanborn Map Image
- Most recent Sanborn Map Image

Navigating the Electronic Sanborn Image File



1. Open file on screen.
2. Identify TP (Target Property) on the most recent map.
3. Find TP on older printed images.
4. Using Acrobat® Reader®, zoom to 250% in order to view more clearly. (200-250% is the approximate equivalent scale of hardcopy Sanborn Maps.)
   A. On the menu bar, click "View" and then "Zoom to..."
   B. Or, use the magnifying tool and drag a box around the TP

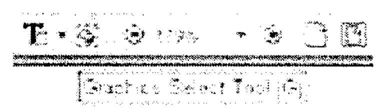
Printing a Sanborn Map From the Electonic File

- EDR recommends printing images at 300 dpi (300 dpi prints faster than 600 dpi)
- To print only the TP area, cut and paste from Acrobat to your word processor application.

<u>Acrobat Versions 6 and 7</u>

1. Go to the menu bar
2. Click the "Select Tool"
3. Draw a box around the area selected
4. "Right click" on your mouse
5. Select "Copy Image to Clipboard"
6. Go to Word Processor such as Microsoft Word, paste and print.

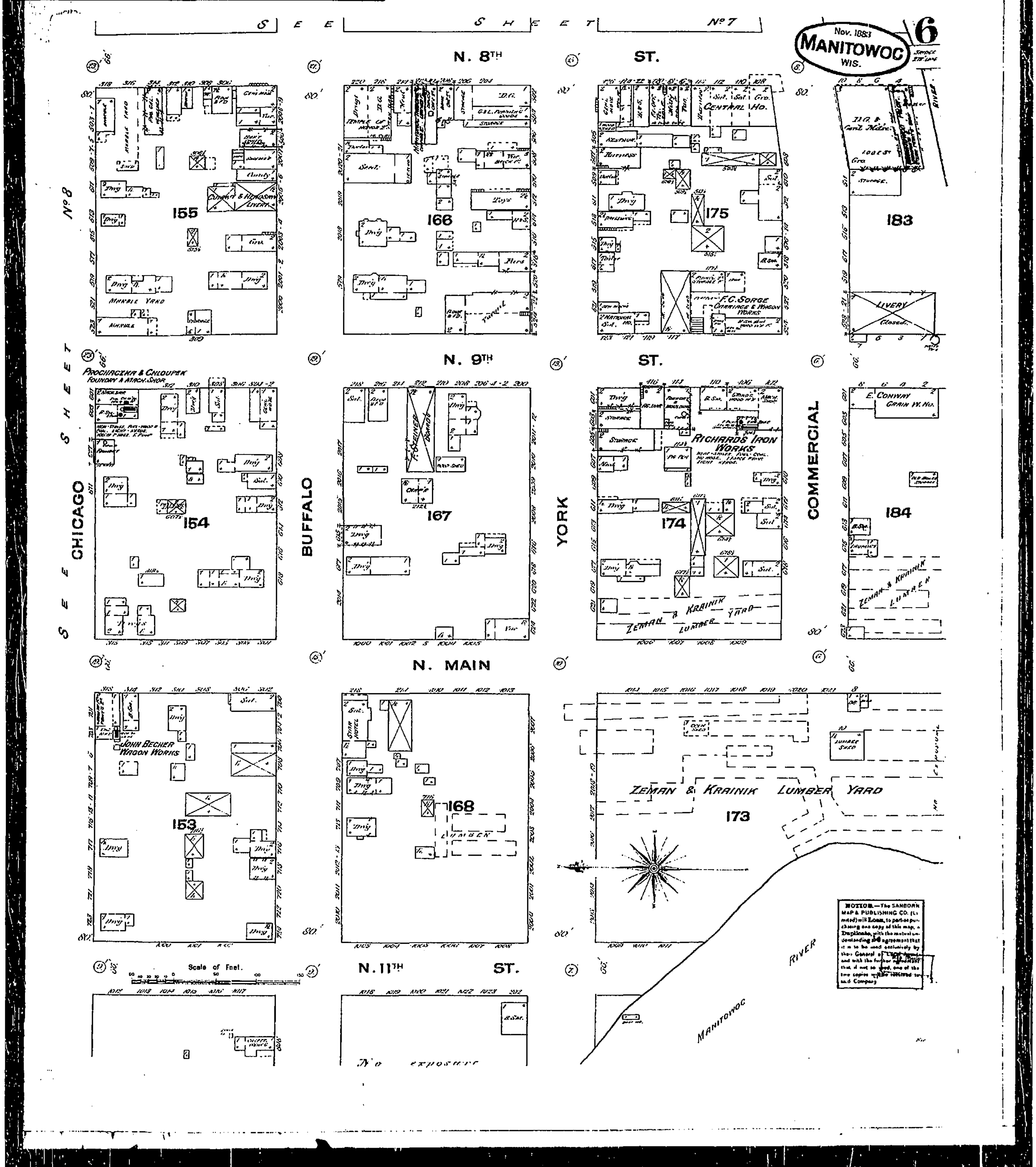
<u>Acrobat Version 5</u>

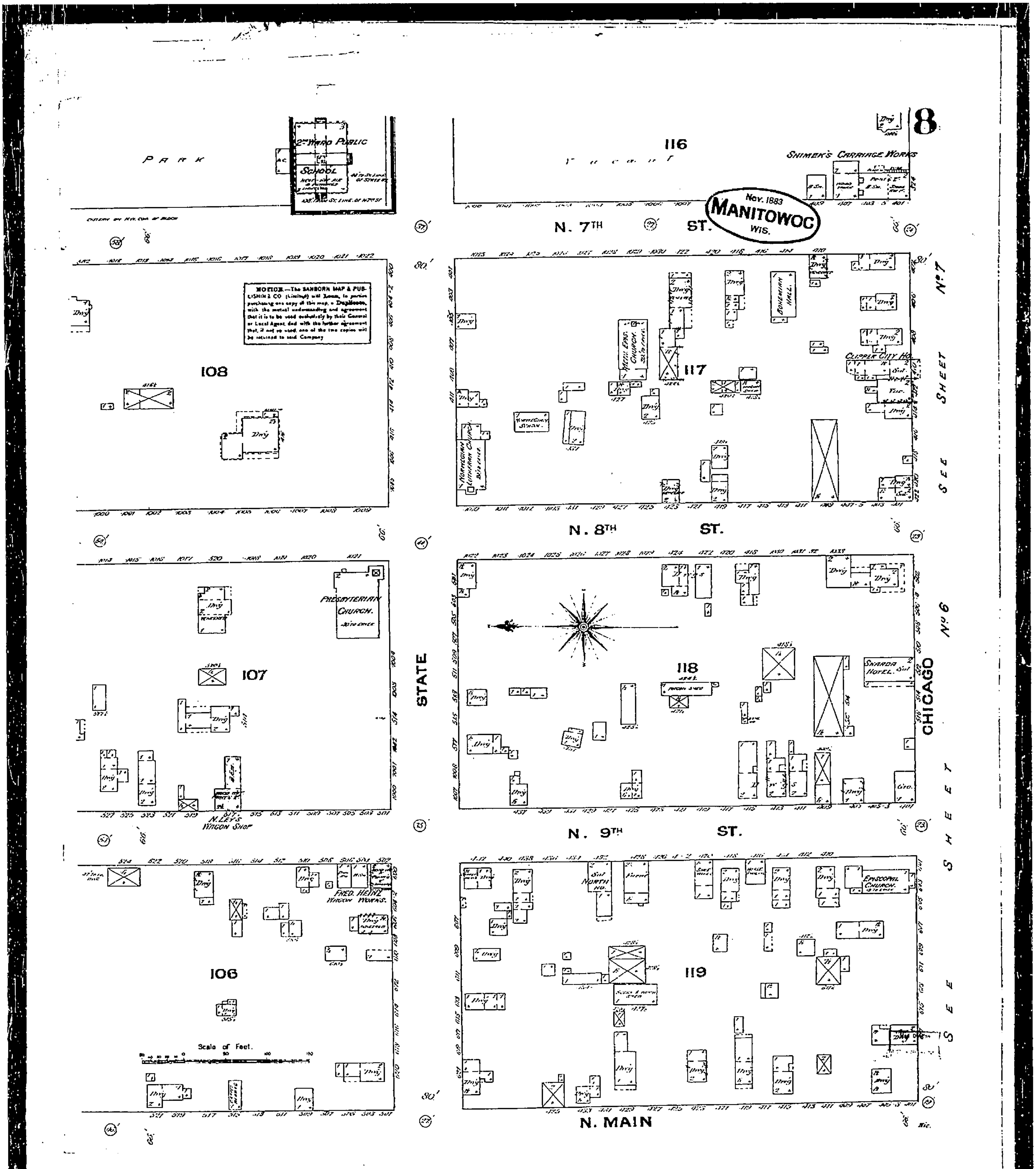


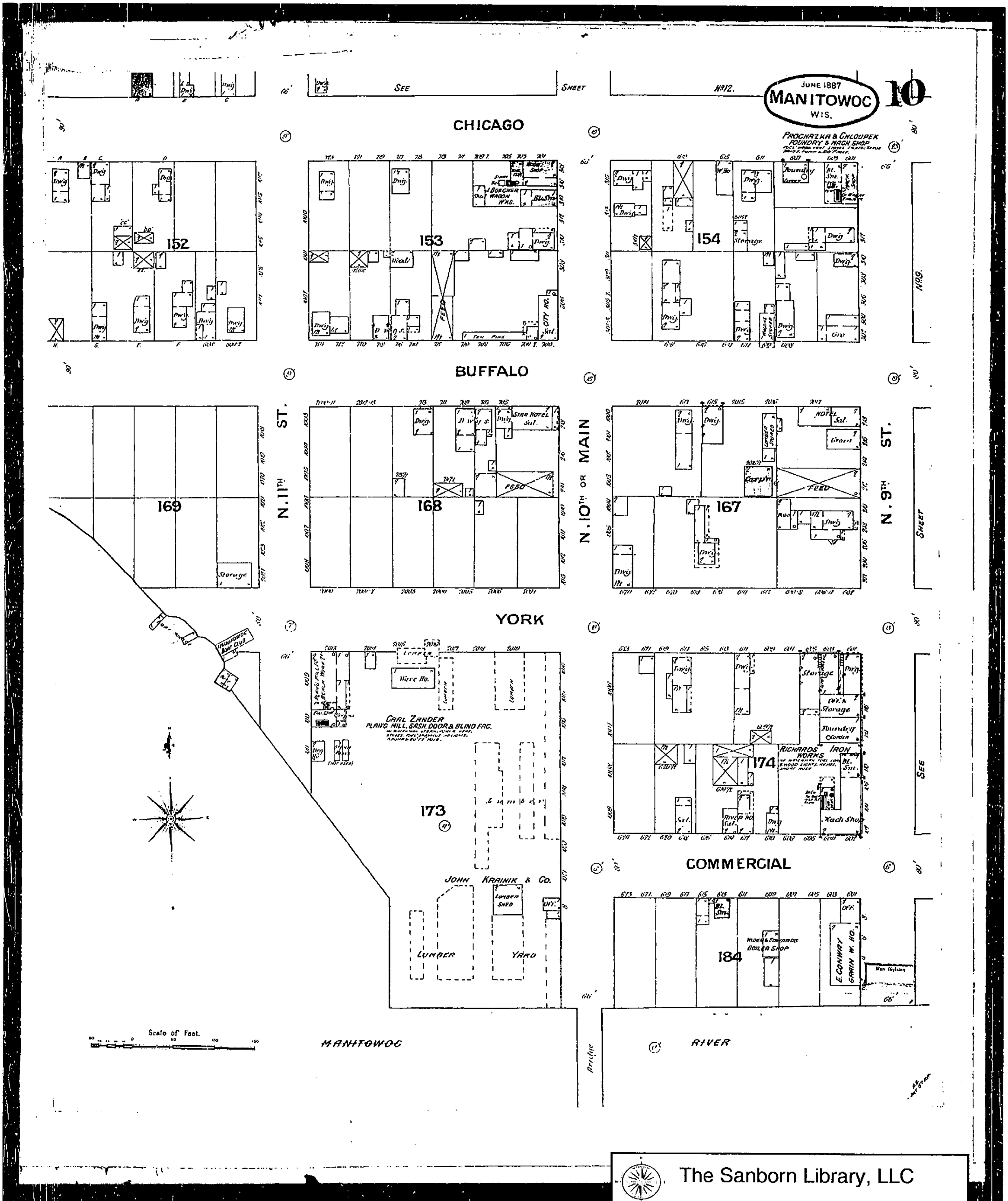
1. Go to the menu bar
2. Click the "Graphics Select Tool"
3. Draw a box around the area selected
4. Go to "Menu"
5. Highlight "Edit"
6. Highlight "Copy"
7. Go to Word Processor such as Microsoft Word, paste and print.

Important Information about Email Delivery of Electronic Sanborn Map Images

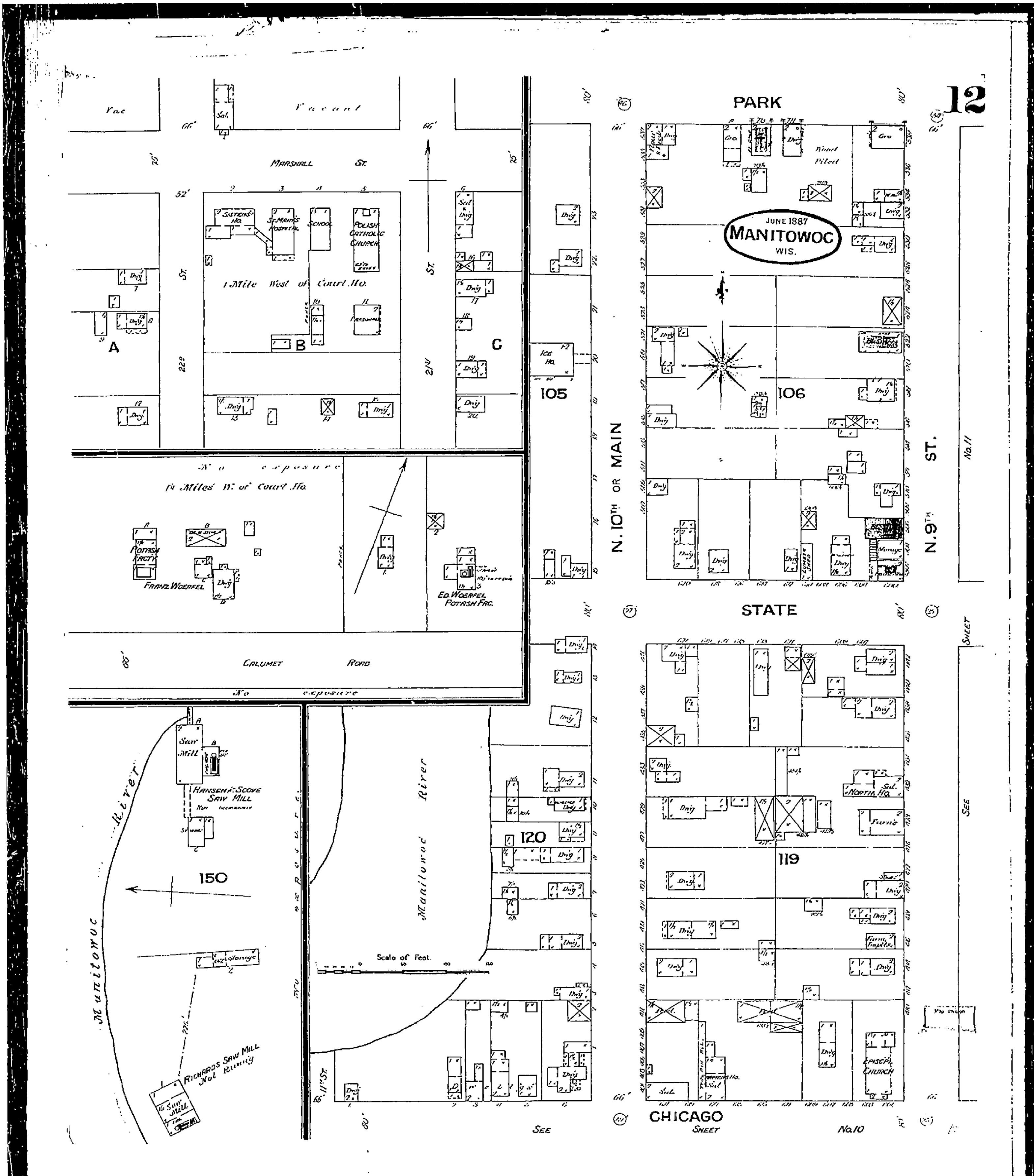
- Images are grouped intro one file, up to 2MB.
- In cases where in excess of 6-7 map years are available, the file size typically exceeds 2MB. In these cases, you will receive multiple files, labeled as "1 of 3", "2 of 3", etc. including all available map years.
- Due to file size limitations, certain ISPs, including AOL, may occasionally delay or decline to deliver files. Please contact your ISP to identify their specific file size limitations.

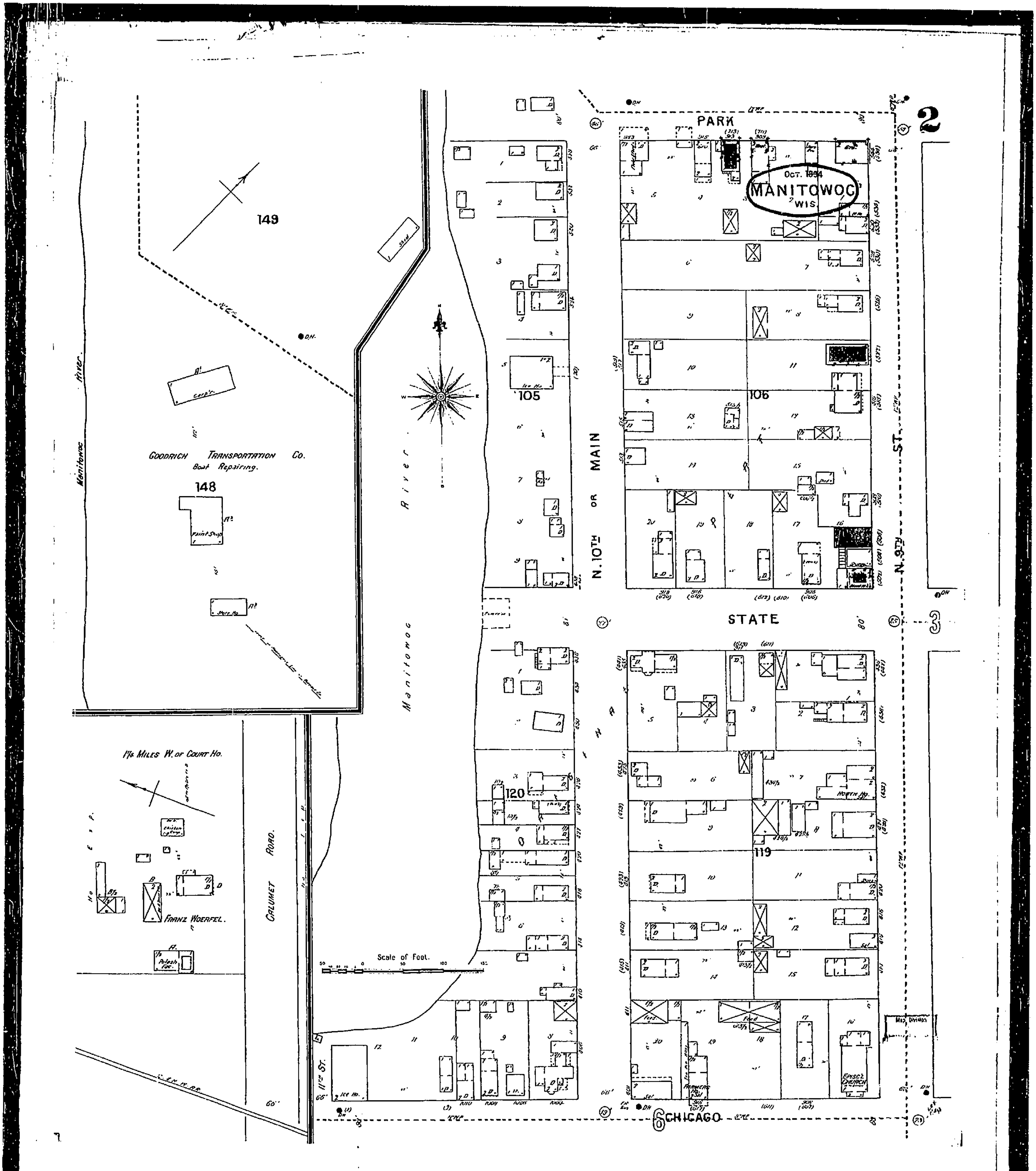

SEE SHEET No 7
Nov. 1883
MANITOWOC
WIS.
6
N. 8TH ST.
N. 9TH ST.
N. MAIN
N. 11TH ST.
CHICAGO
BUFFALO
YORK
COMMERCIAL
SEE SHEET No 8
155
166
175
183
154
167
174
184
153
168
173
CENTRAL HO.
F.C. SORGE CARRIAGE & WAGON WORKS
LIVERY
Closed
PROCHAZKA & CHLOUPEK FOUNDRY & MACH. SHOP
F. STEINER BOARDS
RICHARDS IRON WORKS
E. CONWAY GRAIN W. HO.
ZEMAN & KRAINIK LUMBER YARD
JOHN BECHER WAGON WORKS
STAR HOTEL
LUMBER
MARBLE YARD
Scale of Feet.
MANITOWOC RIVER
No exposure
NOTICE.—The SANBORN MAP & PUBLISHING CO. (Limited) will Loan, to parties purchasing one copy of this map, a Duplicate, with the mutual understanding and agreement that it is to be used exclusively by their General or Local Agent, and with the further agreement that, if not so used, one of the two copies will be returned to said Company

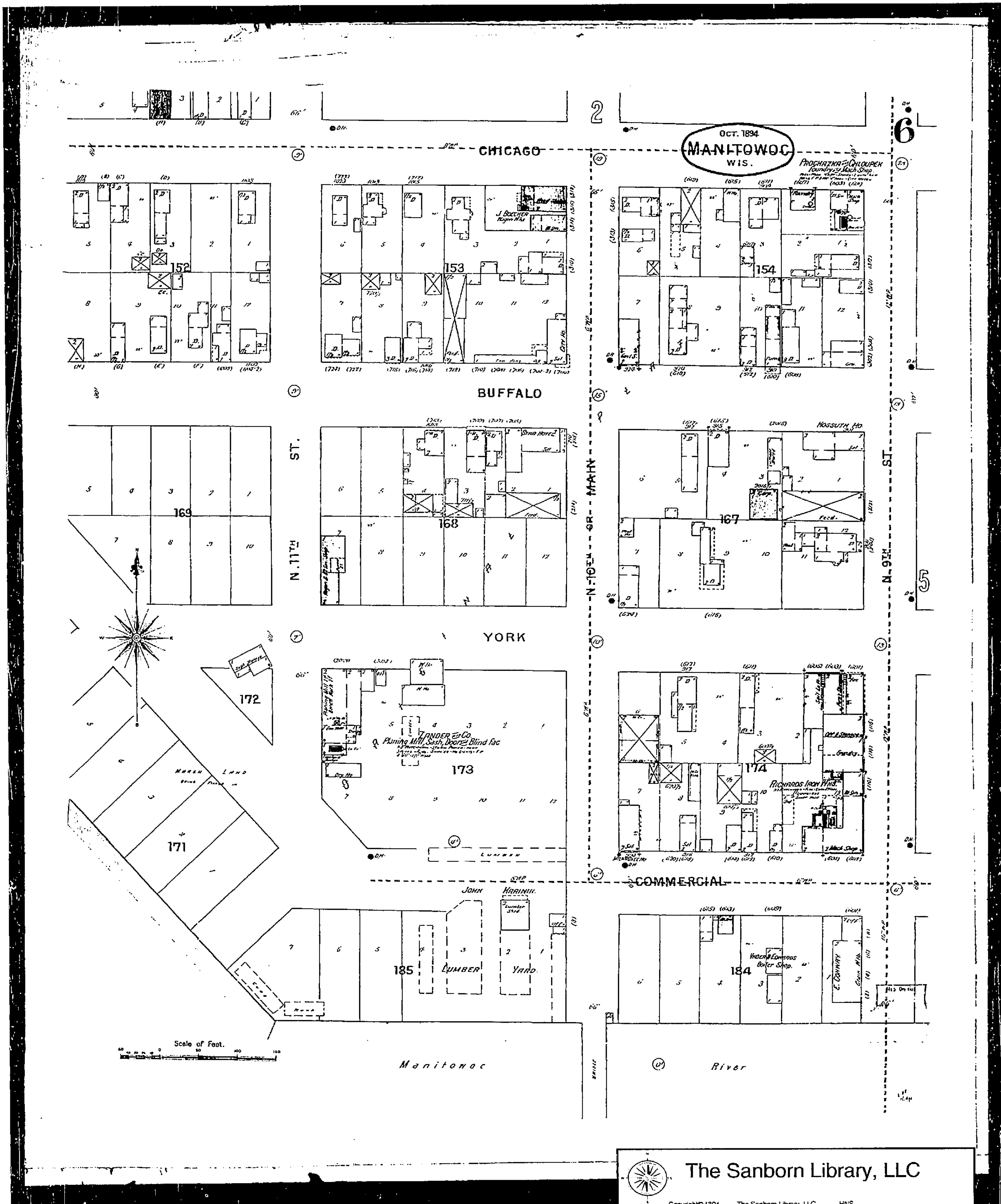

8
MANITOWOC WIS.
Nov. 1883
PARK
2nd Ward Public School
116
Shimek's Carriage Works
N. 7TH ST.
108
107
106
117
118
119
STATE
N. 8TH ST.
N. 9TH ST.
N. MAIN
CHICAGO
SEE SHEET No 7
SEE SHEET No 6
Bohemian Hall
Meth. Epis. Church
Norwegian Lutheran Church
Clipper City Ho.
Presbyterian Church
Sharon Hotel
N. Ley's Wagon Shop
Fred. Heinz Wagon Works
North Ho.
Episcopal Church
Scale of Feet.



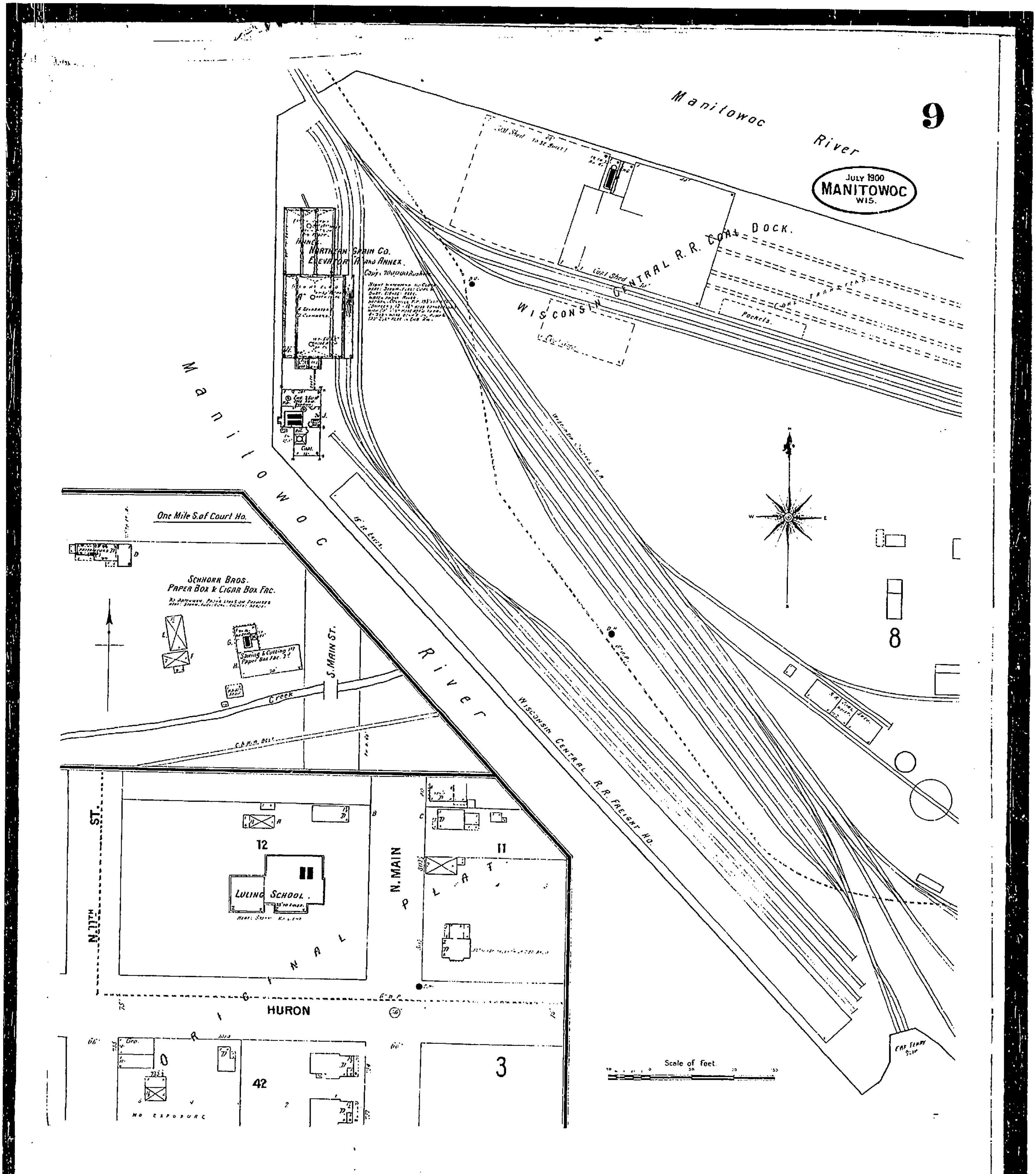
JUNE 1887
MANITOWOC
WIS.
10
SEE SHEET No. 12.
CHICAGO
BUFFALO
YORK
COMMERCIAL
N. 11TH ST.
N. 10TH OR MAIN
N. 9TH ST.
SEE SHEET No. 9.
PROCHAZKA & CHLOUPEK FOUNDRY & MACH. SHOP
BORCHER WAGON WKS.
STAR HOTEL Sal.
HOTEL Sal.
FEED
CARL ZANDER PLAN'G MILL, SASH, DOOR & BLIND FAC.
RICHARDS IRON WORKS
JOHN KRAINIK & Co.
LUMBER YARD
LUMBER SHED
E. CONWAY GRAIN W. HO.
BOILER SHOP
MANITOWOC
RIVER
Scale of Feet.
152
153
154
167
168
169
173
174
184

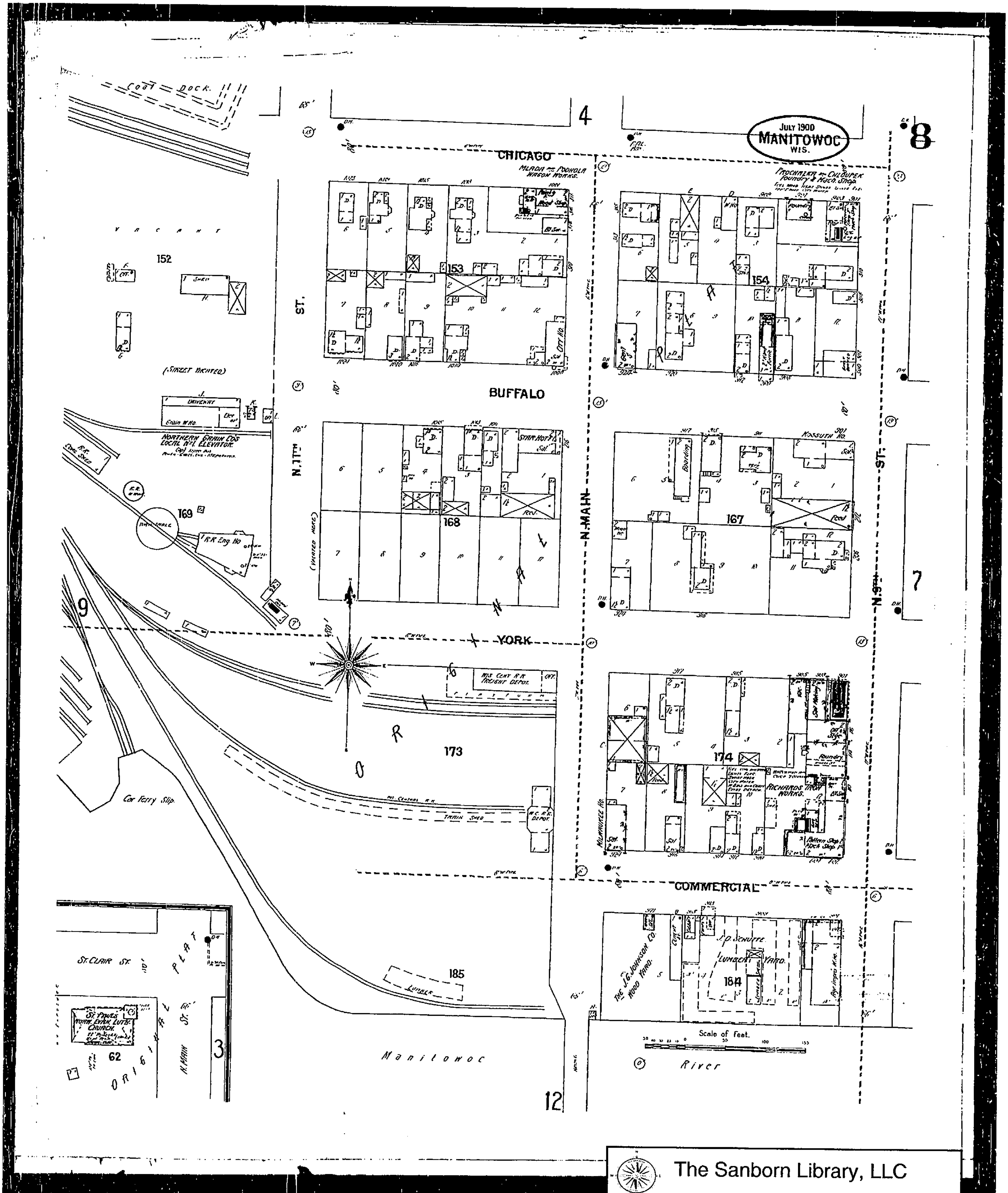

12
JUNE 1887
MANITOWOC
WIS.
PARK
MARSHALL ST.
STATE
CHICAGO
N. 10TH OR MAIN
N. 9TH ST.
CALUMET ROAD
Vacant
Sisters' Ho.
St. Mary's Hospital
School
Polish Catholic Church
1 Mile West of Court Ho.
1½ Miles W. of Court Ho.
No exposure
Potash Fact'y
Franz Woerfel
Ed. Woerfel Potash Fac.
Ice Ho.
Saw Mill
Hansen & Scove Saw Mill
Richards Saw Mill Not Running
Manitowoc River
North Ho.
Episcpl. Church
Scale of Feet.
A
B
C
105
106
119
120
150
See Sheet No. 11
See Sheet No. 10

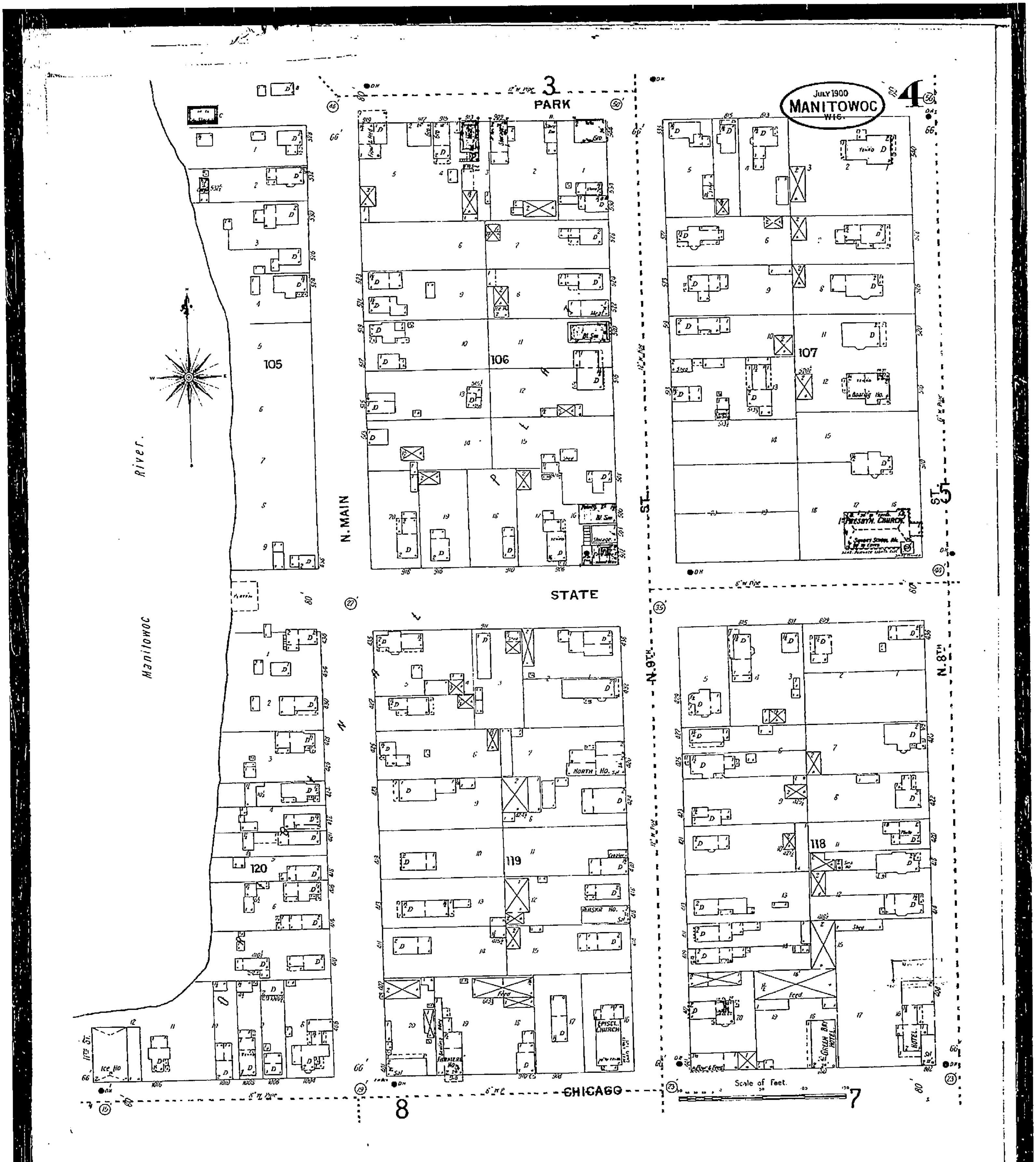

2
PARK
Oct. 1894
MANITOWOC
WIS.
149
148
GOODRICH TRANSPORTATION Co.
Boat Repairing.
Paint Shop
Manitowoc River
River
Manitowoc
105
106
N. 10TH OR MAIN
N. 9TH ST.
STATE
3
120
119
1¼ Miles W. of Court Ho.
Franz Woerfel.
Calumet Road.
Scale of Feet.
11TH ST.
Ice Ho.
Farmers
Episc'l Church
CHICAGO
6



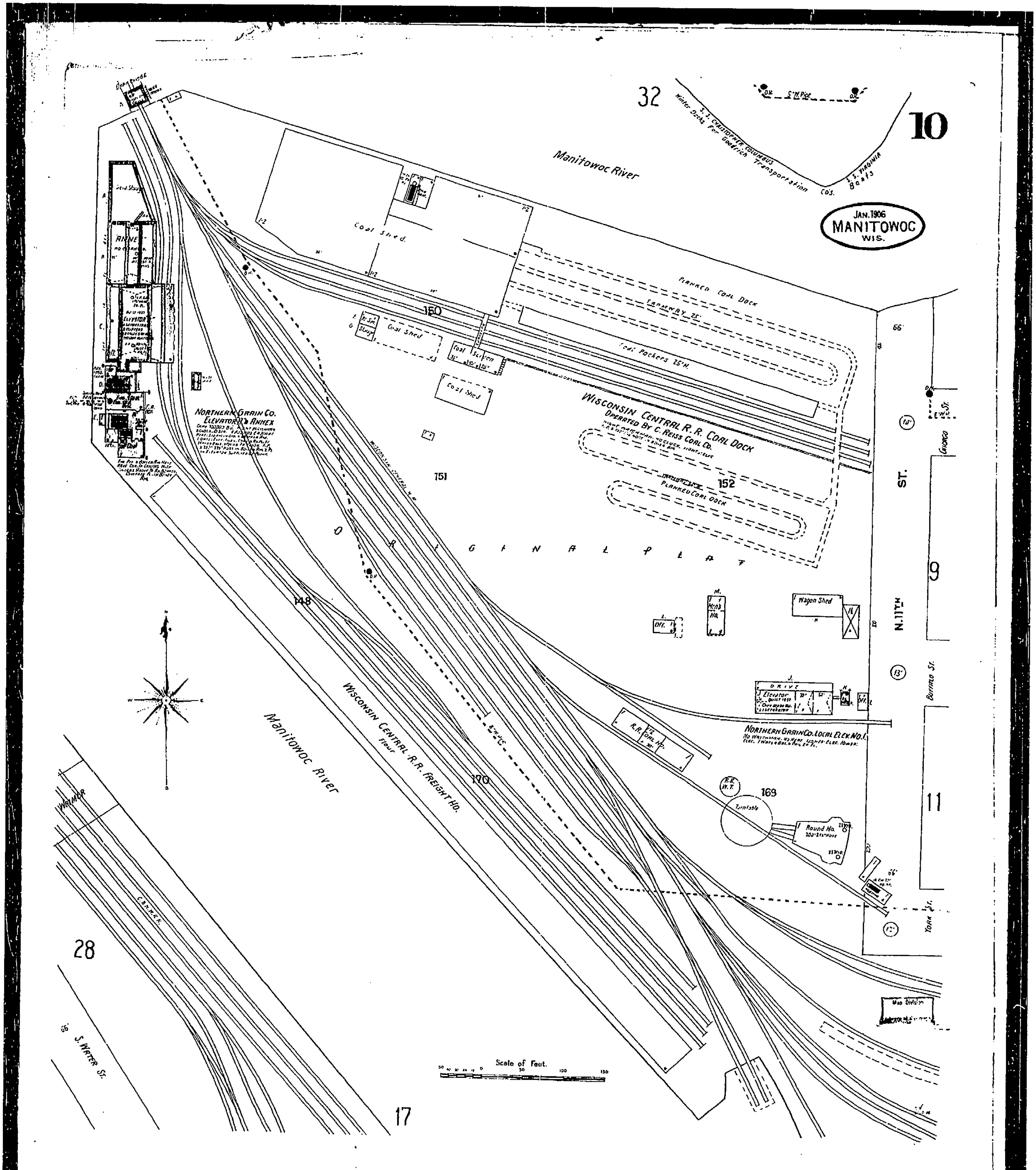
Oct. 1894
MANITOWOC
WIS.
6
2
5
CHICAGO
BUFFALO
YORK
COMMERCIAL
N. 11TH ST.
N. 10TH OR MAIN
N. 9TH ST.
152
153
154
167
168
169
171
172
173
174
184
185
PROCHAZKA & CHLOUPEK Foundry & Mach. Shop
J. BOECHER
STAR HOTEL
KOSSUTH HO.
ZANDER & CO. Planing Mill, Sash, Door & Blind Fac.
RICHARDS IRON WKS.
JOHN HARNISH
LUMBER YARD
VADER & EDWARDS Boiler Shop
E. CONWAY
MARSH LAND
LUMBER
Manitowoc
River
Scale of Feet.

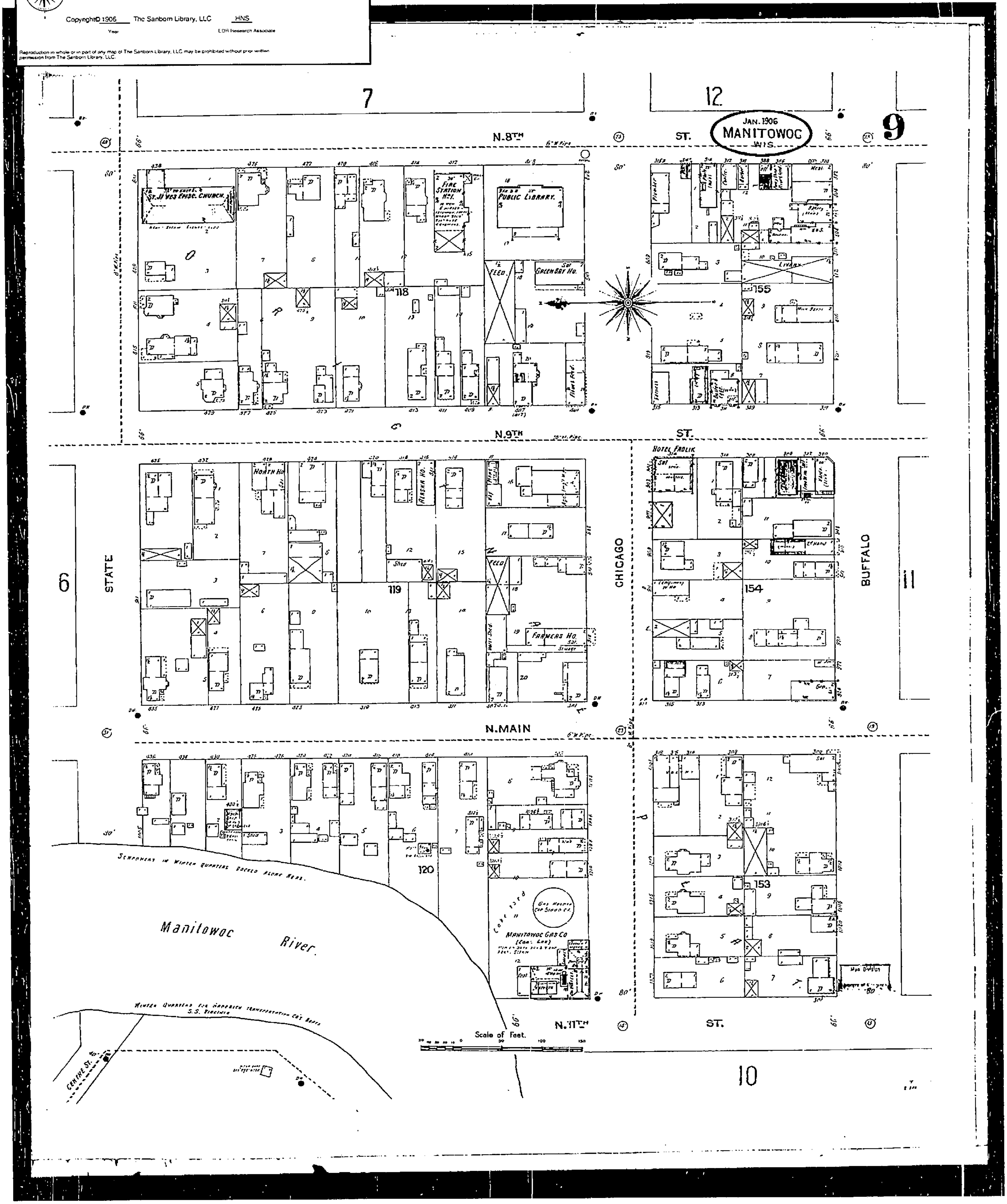

9
July 1900
MANITOWOC
WIS.
Manitowoc River
Coal Dock
Coal Shed
Pockets
Wisconsin Central R.R.
Northern Grain Co.
Elevator "A" and Annex
Annex
Coal
Manitowoc River
One Mile S. of Court Ho.
Schnorr Bros.
Paper Box & Cigar Box Fac.
Sawing & Cutting 1st
Paper Box Fac. 2d
S. Main St.
Creek
Wisconsin Central R.R. Freight Ho.
12
Luling School
N. Main
11
Plat
N. 11th St.
Original
Huron
0
42
3
8
No Exposure
Scale of Feet
Car Ferry Slip

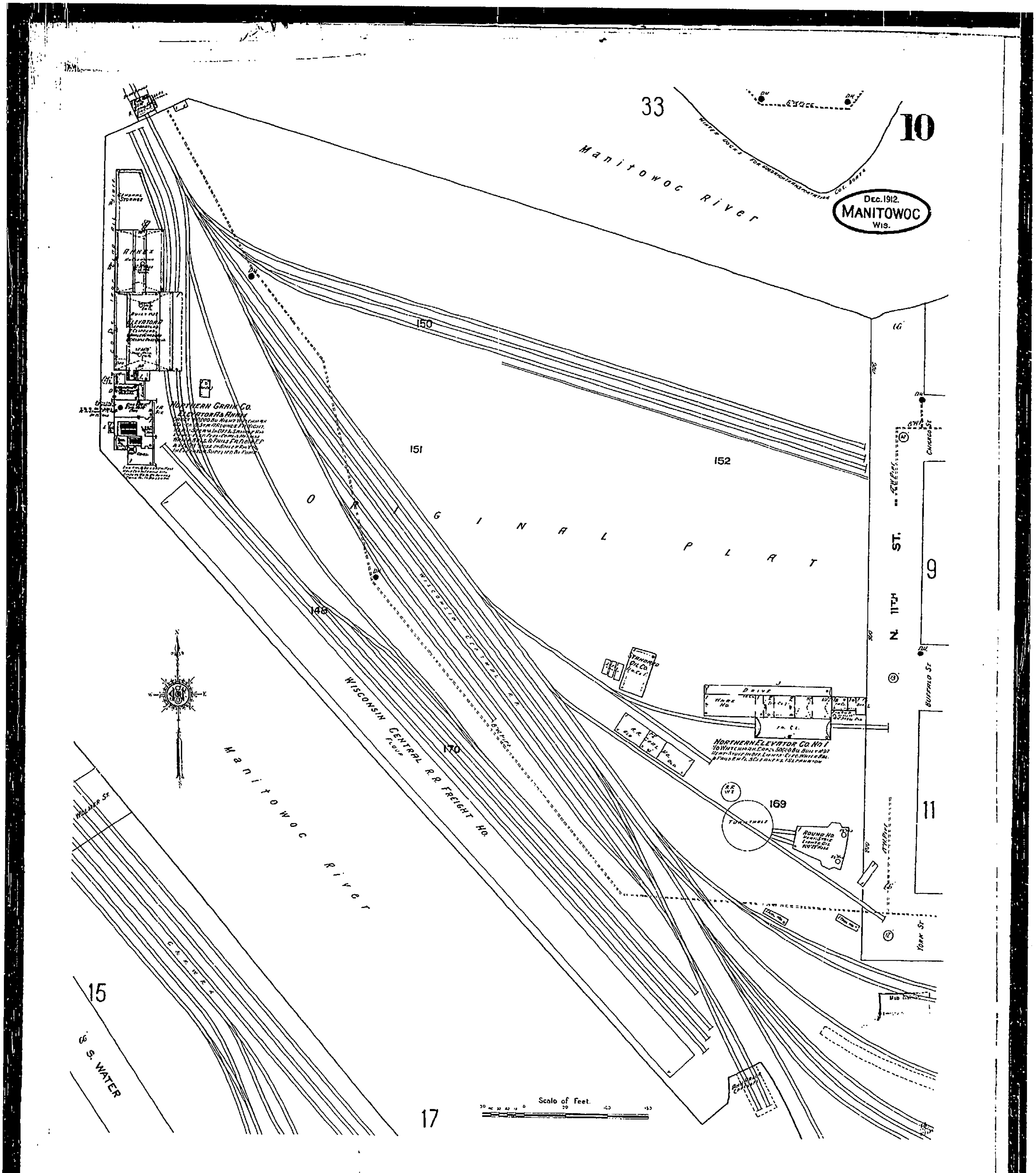

JULY 1900
MANITOWOC
WIS.
8
4
7
9
3
12
CHICAGO
BUFFALO
YORK
COMMERCIAL
N. MAIN
N. 11TH ST.
N. 9TH ST.
COAL DOCK
VACANT
152
153
154
167
168
169
173
174
184
185
62
(STREET VACATED)
NORTHERN GRAIN CO'S LOCAL No. 1 ELEVATOR
R.R. Eng. Ho.
WIS. CENT. R.R. FREIGHT DEPOT
W.C. R.R. DEPOT
TRAIN SHED
Car Ferry Slip
Manitowoc
River
ST. CLAIR ST.
N. MAIN ST.
ORIGINAL PLAT
ST. PAUL'S NORTH. EVAN. LUTH. CHURCH
MLADA & PODHOLA WAGON WORKS
PROCHAZKA & CHLOUPEK FOUNDRY & MACH. SHOP
STAR HOTEL
KOSSUTH HO.
RICHARDS IRON WORKS
MILWAUKEE HO.
J.D. SCHUTTE LUMBER YARD
THE J.G. JOHNSON CO. WOOD YARD
Scale of Feet.

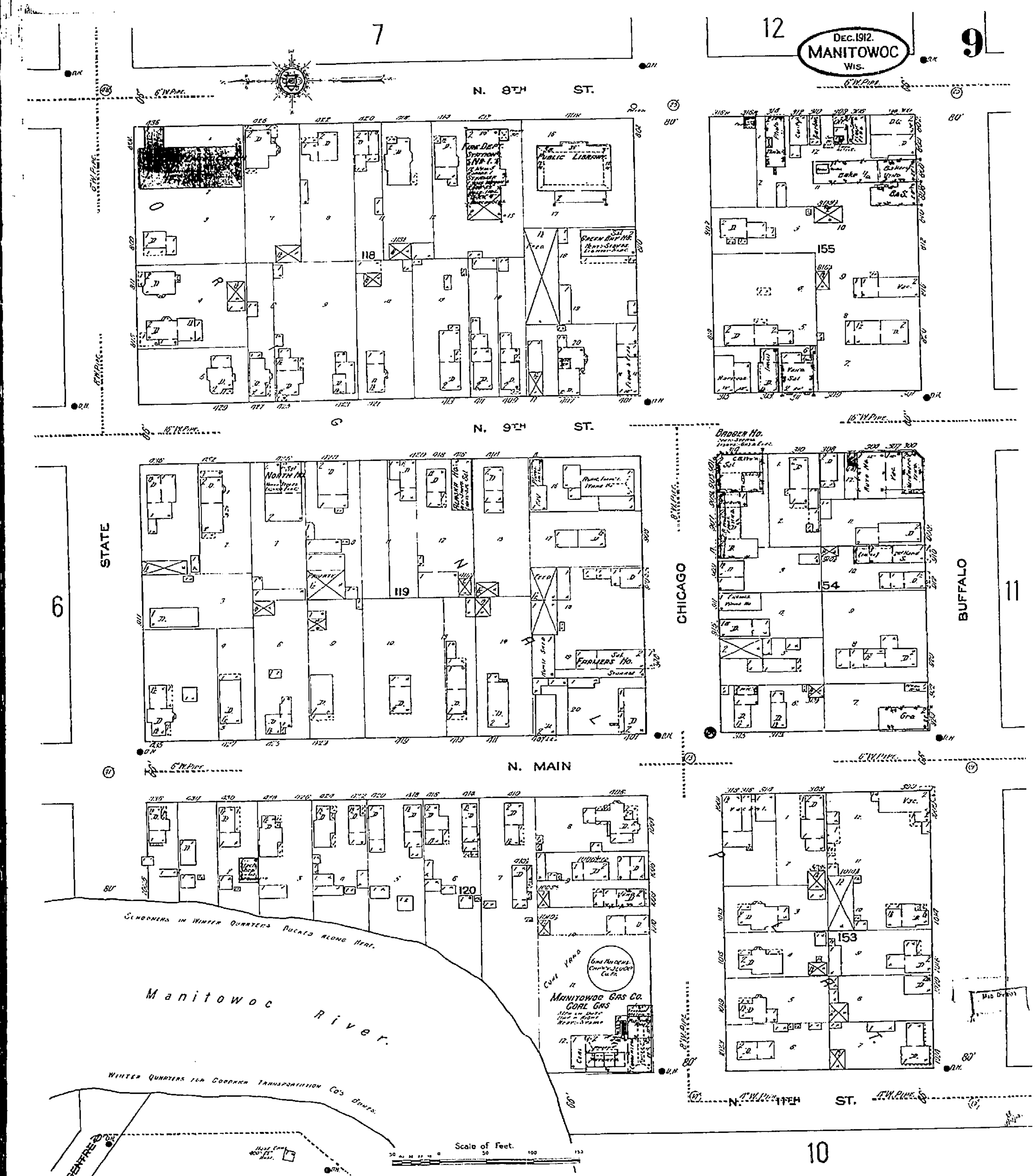


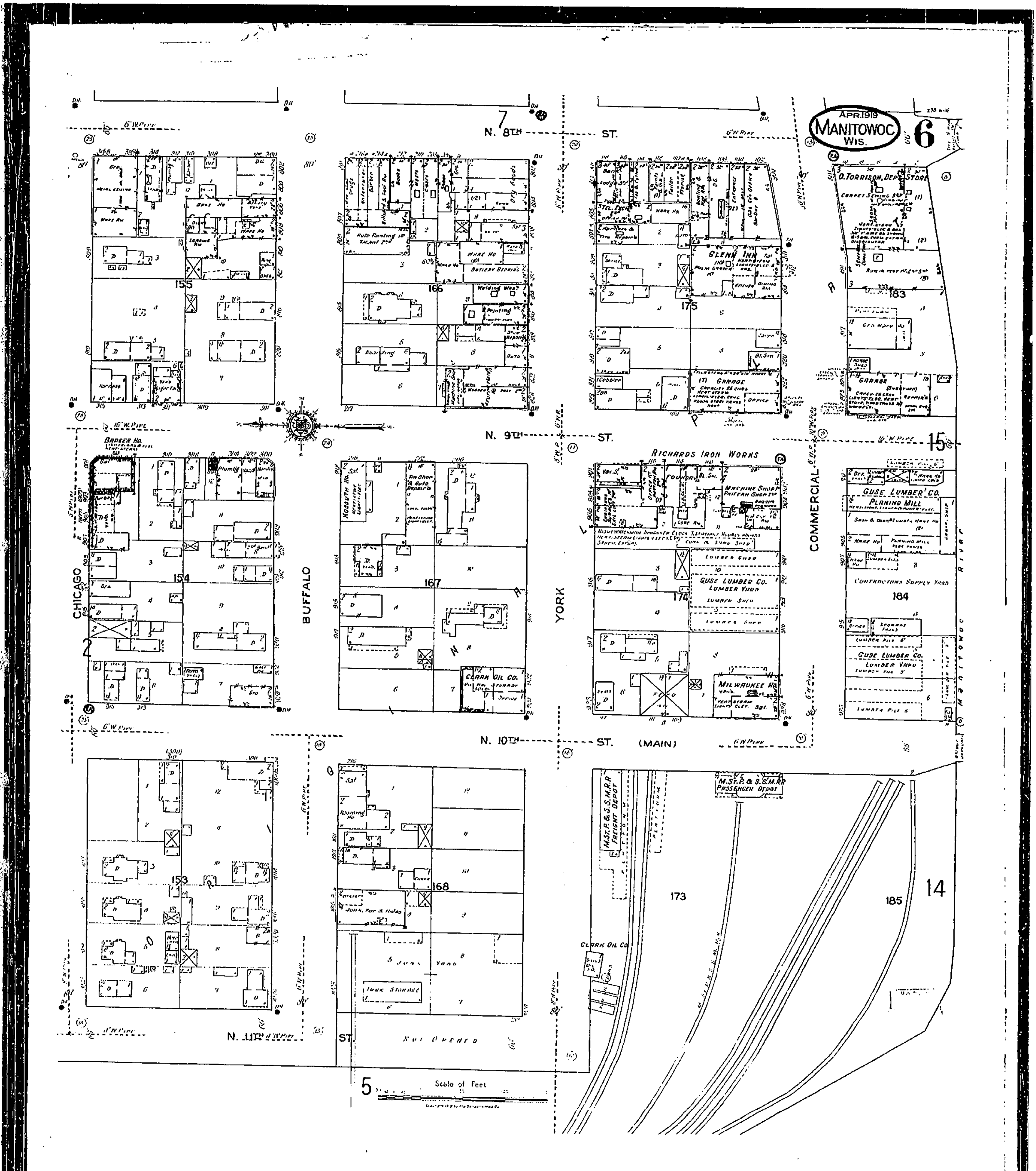
JULY 1900
MANITOWOC
WIS.
3
4
5
7
8
PARK
STATE
CHICAGO
N. MAIN
N. 9TH ST.
N. 8TH ST.
Manitowoc River.
105
106
107
118
119
120
1ST PRESBYTN. CHURCH
EPISCL. CHURCH
NORTH HO.
MASKA HO.
FARMERS HO.
GREEN BAY HOTEL
HOTEL
Ice Ho
Feed
Scale of Feet.

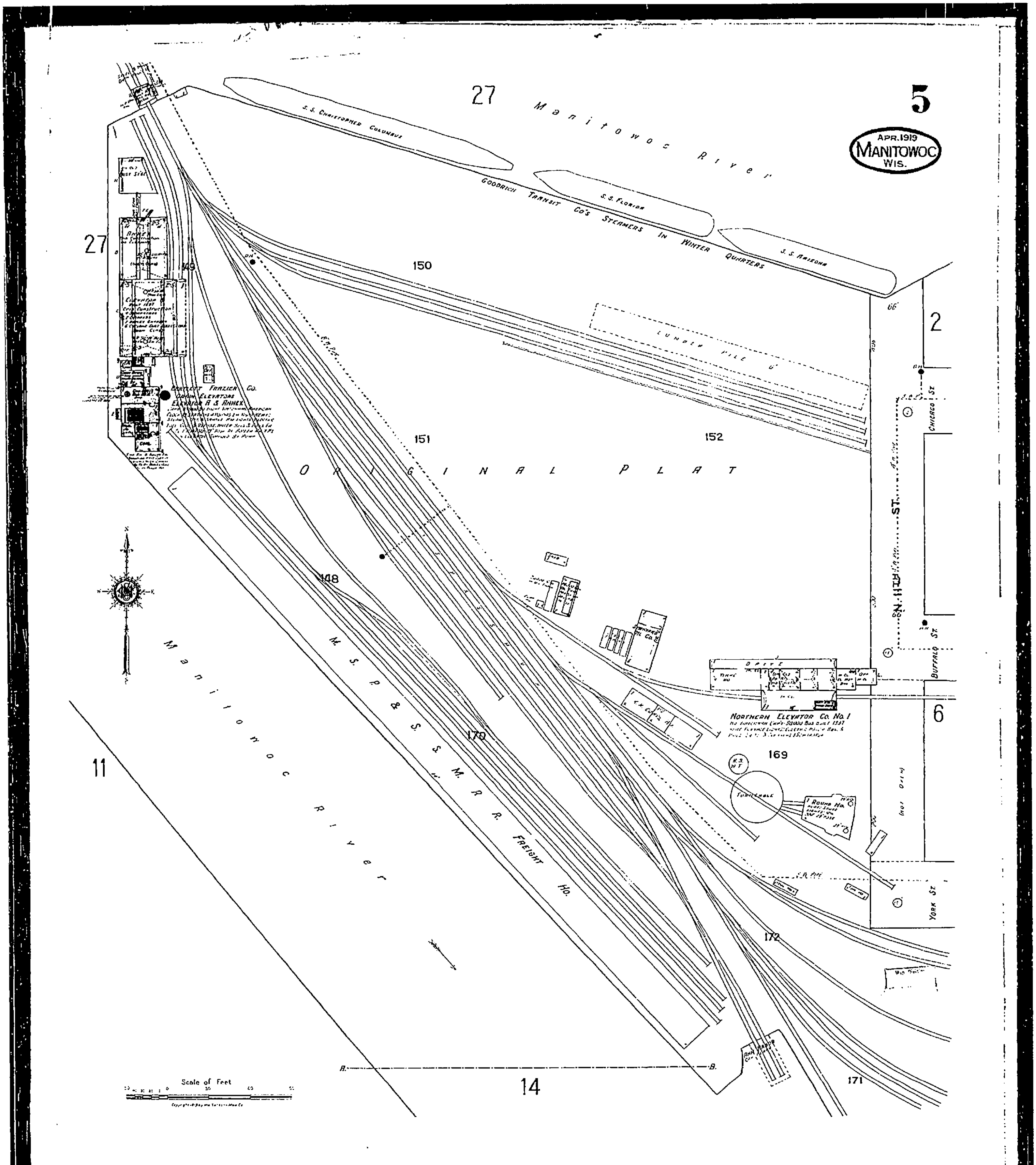

10
32
Manitowoc River
JAN. 1906
MANITOWOC
WIS.
Coal Shed
150
Coal Shed
Coal Screen
Planked Coal Dock
Wisconsin Central R.R. Coal Dock
Operated by C. Reiss Coal Co.
152
Planked Coal Dock
151
Original Plat
Northern Grain Co.
Elevator R. & Annex
Elevator
148
Wagon Shed
N. 11th St.
9
13
Northern Grain Co. Local Elev. No. 1
R.R. Coal Ho.
169
Turntable
Round Ho.
Wisconsin Central R.R. Freight Ho.
Manitowoc River
170
11
York St.
Buffalo St.
Chicago St.
28
S. Water St.
17
Scale of Feet.

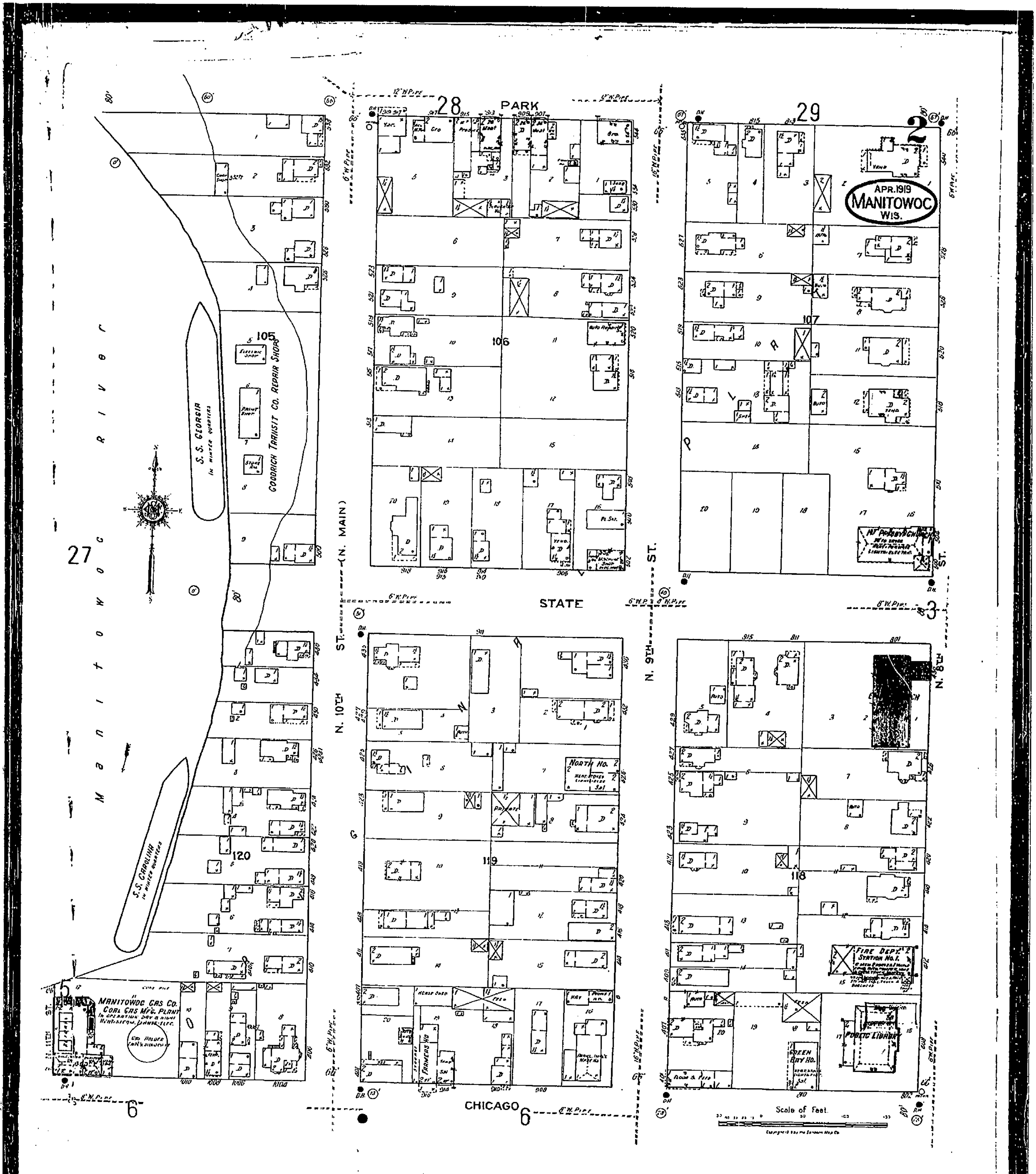

JAN. 1906
MANITOWOC
WIS.
9
7
12
6
11
10
N.8TH ST.
N.9TH ST.
N.MAIN
N.11TH ST.
STATE
CHICAGO
BUFFALO
118
119
120
153
154
155
PUBLIC LIBRARY
FIRE STATION No. 1
GREEN BAY HO.
NORTH HO.
ALASKA HO.
FARMERS HO.
HOTEL FADLIK
FEED
LIVERY
MANITOWOC GAS CO
Manitowoc River
Scale of Feet.
CENTRE ST.

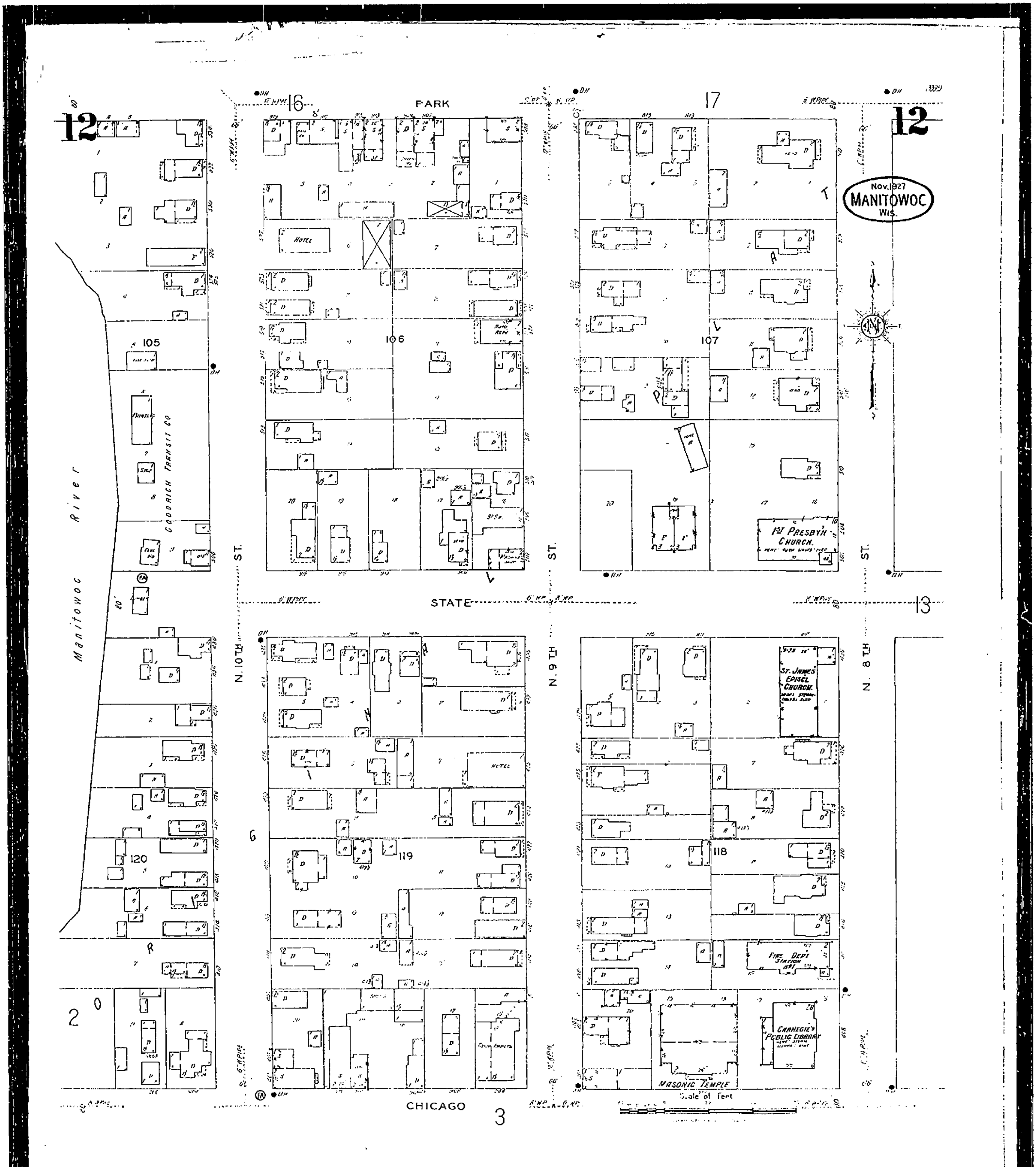

10
33
Manitowoc River
Dec. 1912.
MANITOWOC
WIS.
150
151
152
ORIGINAL PLAT
148
170
169
WISCONSIN CENTRAL R.R. FREIGHT HO.
Manitowoc River
NORTHERN GRAIN CO.
NORTHERN ELEVATOR CO. No 1
STANDARD OIL CO.
ROUND HO.
N. 11TH ST.
9
11
15
17
S. WATER
Scale of Feet.


9
DEC. 1912.
MANITOWOC
WIS.
7
12
N. 8TH ST.
N. 9TH ST.
N. MAIN
N. 11TH ST.
STATE
CHICAGO
BUFFALO
6
11
10
118
119
120
153
154
155
FIRE DEPT. STATION NO. 1
PUBLIC LIBRARY
NORTH HO.
BADGER HO.
FARMERS HO.
MANITOWOC GAS CO.
COAL GAS
Manitowoc River.
Schooners in Winter Quarters Docked along Here.
Winter Quarters for Goodrich Transportation Co's Boats.
Scale of Feet.

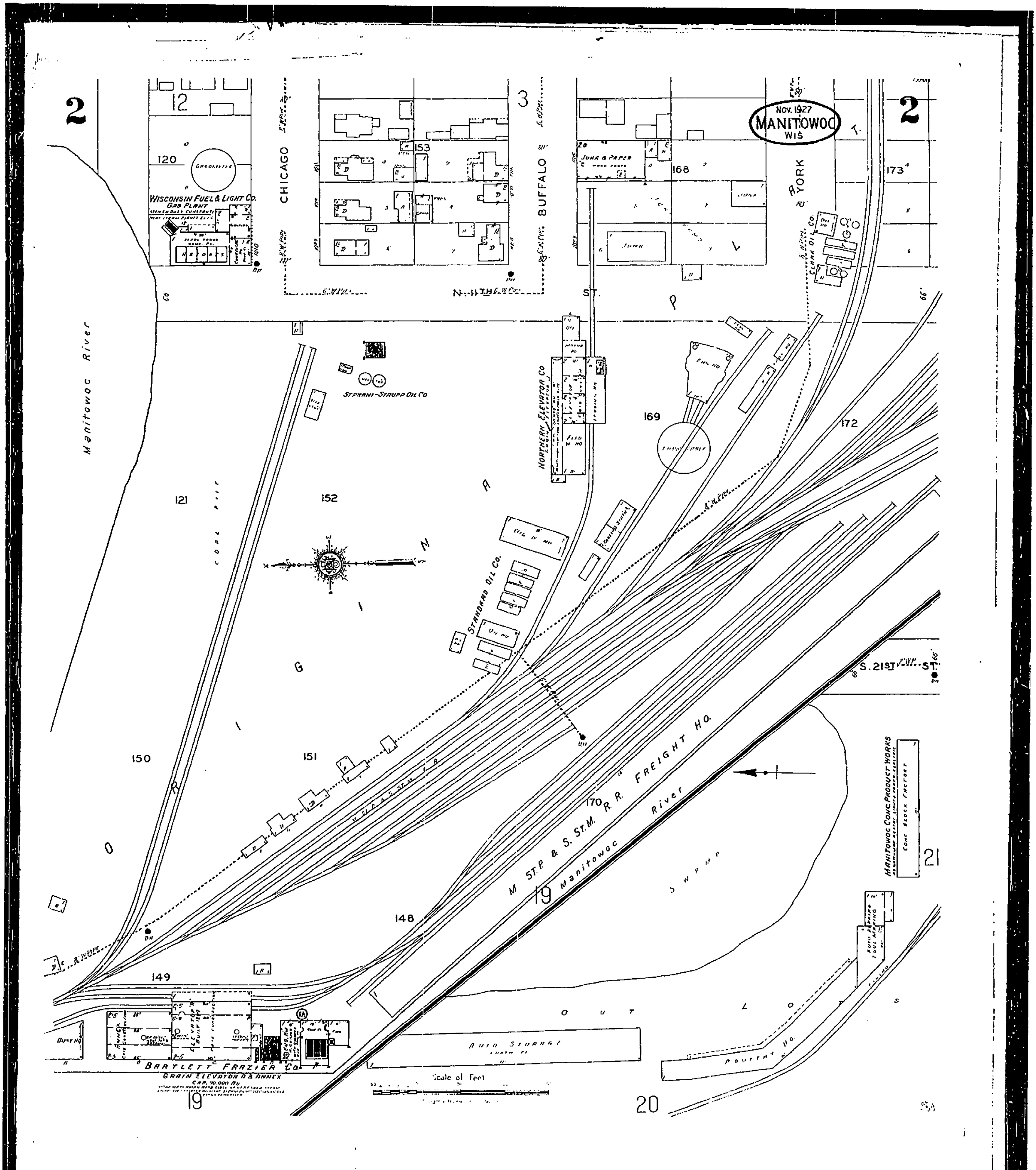

APR. 1919
MANITOWOC
WIS.
6
N. 8TH ST.
N. 9TH ST.
N. 10TH ST. (MAIN)
N. 11TH ST.
CHICAGO
BUFFALO
YORK
COMMERCIAL
NOT OPENED
O. TORRISON, DEPT. STORE
GLENN INN
GARAGE
RICHARDS IRON WORKS
MACHINE SHOP
PATTERN SHOP
FOUNDRY
GUSE LUMBER CO.
PLANING MILL
GUSE LUMBER CO. LUMBER YARD
LUMBER SHED
MILWAUKEE HO.
CLARK OIL CO.
BADGER HO.
KOSSUTH HO.
BATTERY REPAIRS
WELDING
PRINTING
BOARDING
ROOMING HO.
JUNK, FUR & HIDES
JUNK YARD
JUNK STORAGE
M.ST.P. & S.S.M.R.R. PASSENGER DEPOT
M.ST.P. & S.S.M.R.R. FREIGHT DEPOT
CONTRACTORS SUPPLY YARD
7
15
2
5
14
153
154
155
166
167
168
173
174
175
183
184
185
Scale of Feet

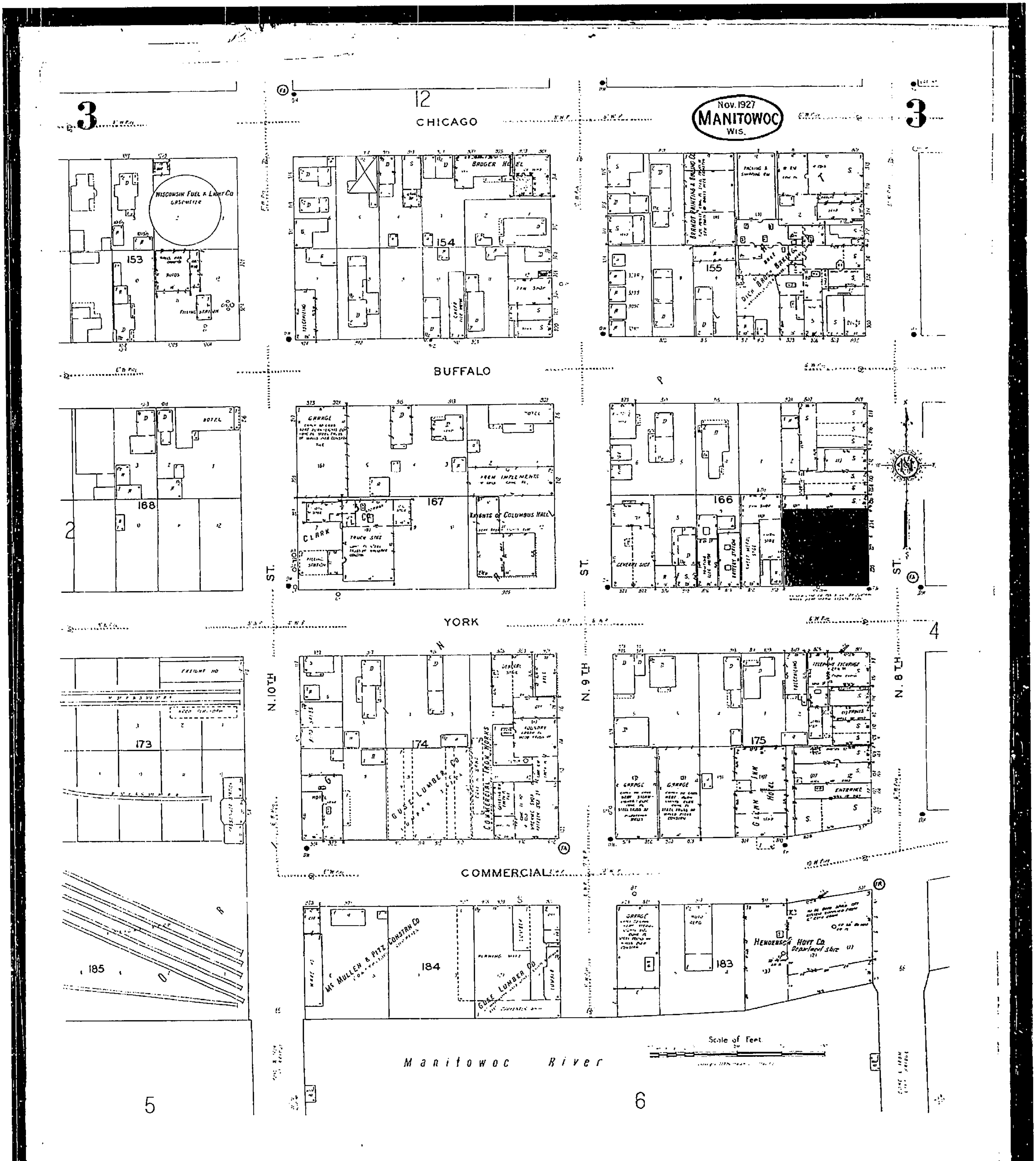

5
APR. 1919
MANITOWOC
WIS.
27
Manitowoc River
S.S. Christopher Columbus
S.S. Florida
S.S. Arizona
Goodrich Transit Co's Steamers in Winter Quarters
150
151
152
149
148
170
169
172
171
2
6
11
14
Original Plat
Lumber Pile
Bartlett Frazier Co.
Grain Elevators
Elevator A & S Annex
Northern Elevator Co. No. 1
Turntable
M. S. P. & S. S. M. R. R. Freight Ho.
N. 11TH ST.
Chicago St.
Buffalo St.
York St.
Scale of Feet


2
APR. 1919
MANITOWOC
WIS.
PARK
STATE
CHICAGO
N. 10TH ST. (N. MAIN)
N. 9TH ST.
N. 8TH ST.
Manitowoc River
27
28
29
3
5
6
105
106
107
118
119
120
S.S. GEORGIA
IN WINTER QUARTERS
GOODRICH TRANSIT CO. REPAIR SHOPS
S.S. CAROLINA
IN WINTER QUARTERS
MANITOWOC GAS CO.
COAL GAS MFG. PLANT
NORTH HO.
FIRE DEPT.
STATION NO. 1
PUBLIC LIBRARY
GREEN BAY HO.
FARMERS HO.
Scale of Feet

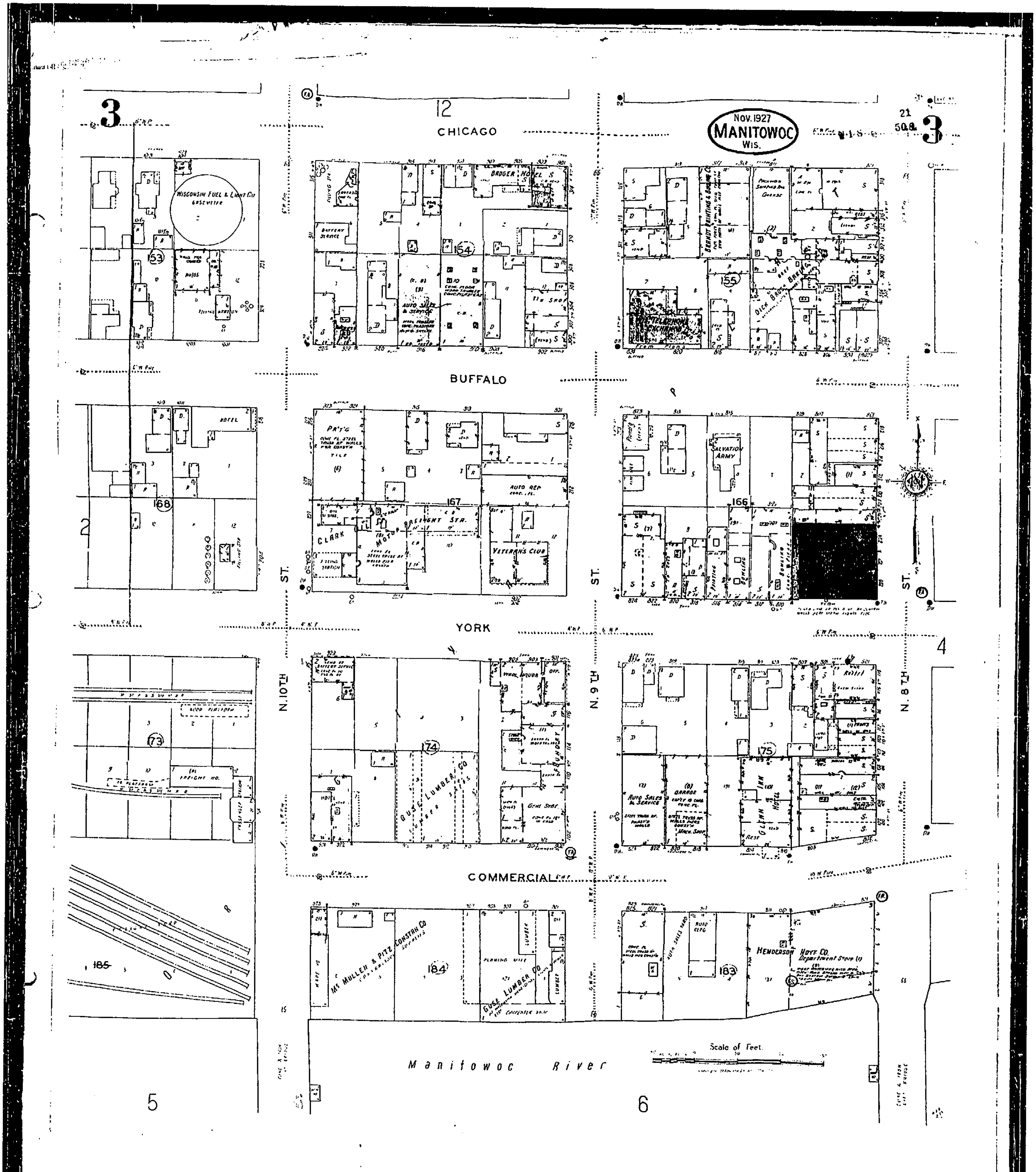


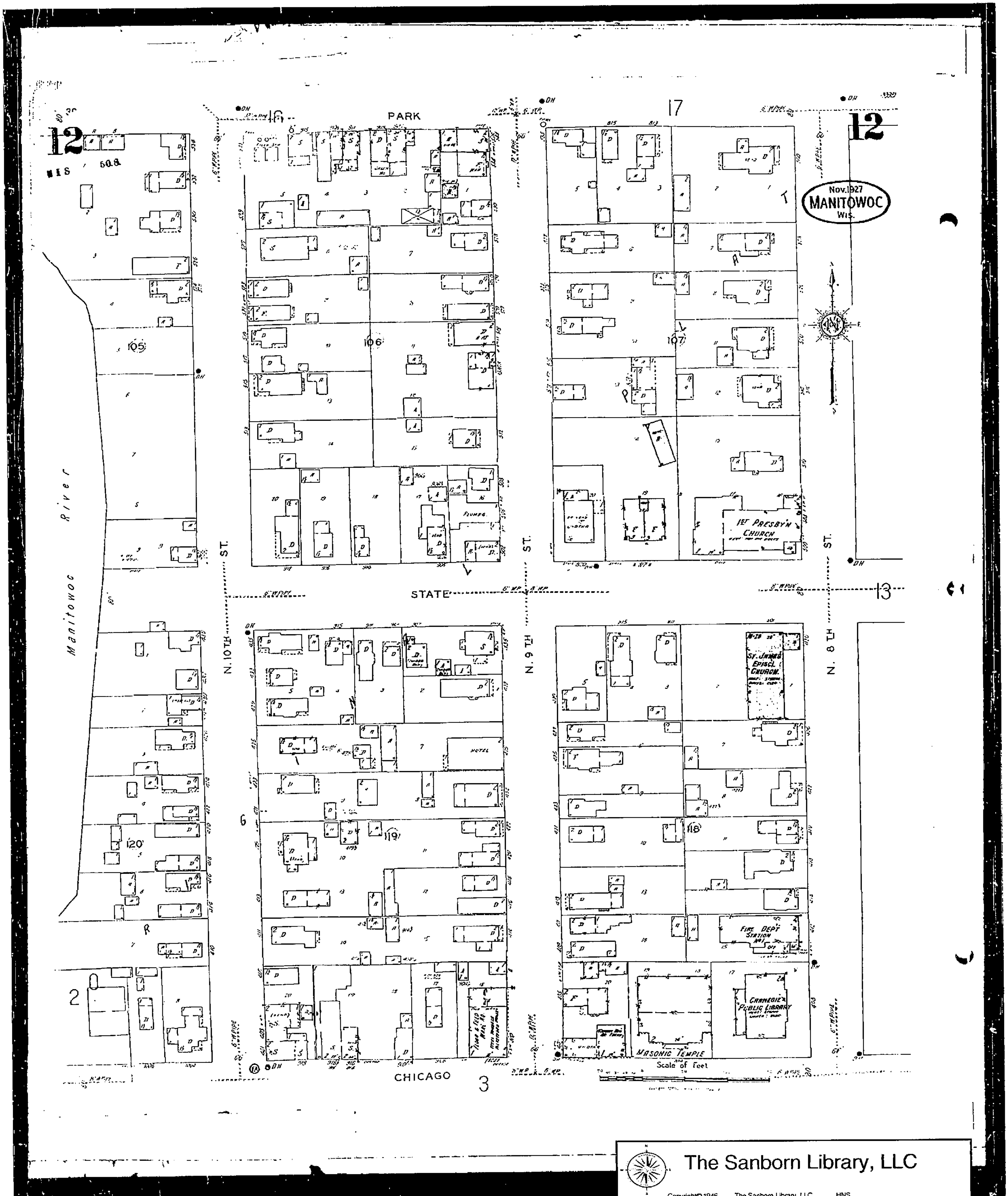
12
16
PARK
17
12
Nov. 1927
MANITOWOC
Wis.
105
106
107
HOTEL
GOODRICH TRANSIT CO
Manitowoc River
N. 10TH ST.
N. 9TH ST.
N. 8TH ST.
STATE
13
1ST PRESBYN CHURCH.
ST. JAMES EPISCL CHURCH.
HOTEL
120
119
118
FIRE DEPT STATION NO 1
CARNEGIE'S PUBLIC LIBRARY
MASONIC TEMPLE
Scale of Feet
20
CHICAGO
3


2
12
120
Gasometer
WISCONSIN FUEL & LIGHT Co.
GAS PLANT
RETORTS
CHICAGO
3
153
BUFFALO
JUNK & PAPER
168
JUNK
YORK
173
CLARK OIL CO.
Nov. 1927
MANITOWOC
WIS.
2
N. 11TH
ST.
P
Manitowoc River
STEPHANI-STAUPP OIL CO.
NORTHERN ELEVATOR CO.
FEED W. HO.
ENG. HO.
169
172
121
152
A
N
OIL W. HO.
STANDARD OIL CO.
OIL HO.
I
G
I
150
151
R
170
M. ST. P. & S. ST. M. R. R. FREIGHT HO.
Manitowoc River
MANITOWOC CONC. PRODUCT WORKS
CONC. BLOCK FACTORY
21
S. 21ST ST.
O
19
SWAMP
148
149
OUT LOTS
AUTO STORAGE
POULTRY HO.
BARTLETT FRAZIER Co.
GRAIN ELEVATOR & ANNEX
CAP. 70,000 Bu.
Scale of Feet
19
20

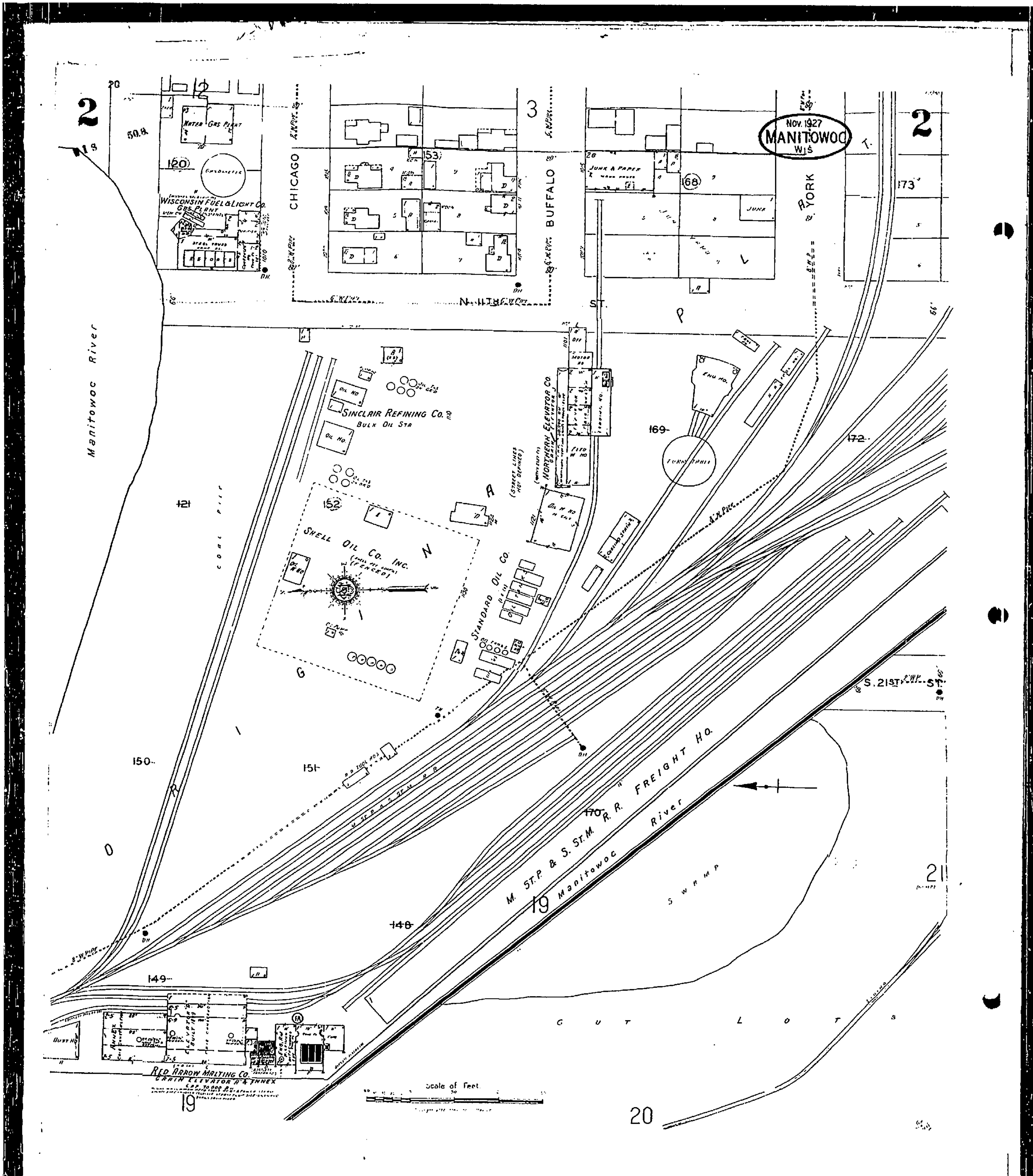


3
12
CHICAGO
Nov. 1927
MANITOWOC
WIS.
3
WISCONSIN FUEL & LIGHT CO
GASOMETER
153
154
BADGER HOTEL
155
DICK BROS BAKING
BUFFALO
HOTEL
188
167
FARM IMPLEMENTS
KNIGHTS OF COLUMBUS HALL
CLARK
FILLING STATION
166
2
YORK
N. 10TH ST.
N. 9TH ST.
N. 8TH ST.
4
FREIGHT HO
173
174
BUSS LUMBER CO
COMMERCIAL IRON WORKS
175
GLENN INN HOTEL
GARAGE
ENTRANCE
COMMERCIAL
MC MULLEN & PITZ CONSTRN CO
184
GUSE LUMBER CO
183
HENDERSON & HOYT CO
Department Store
185
Manitowoc River
Scale of Feet
5
6

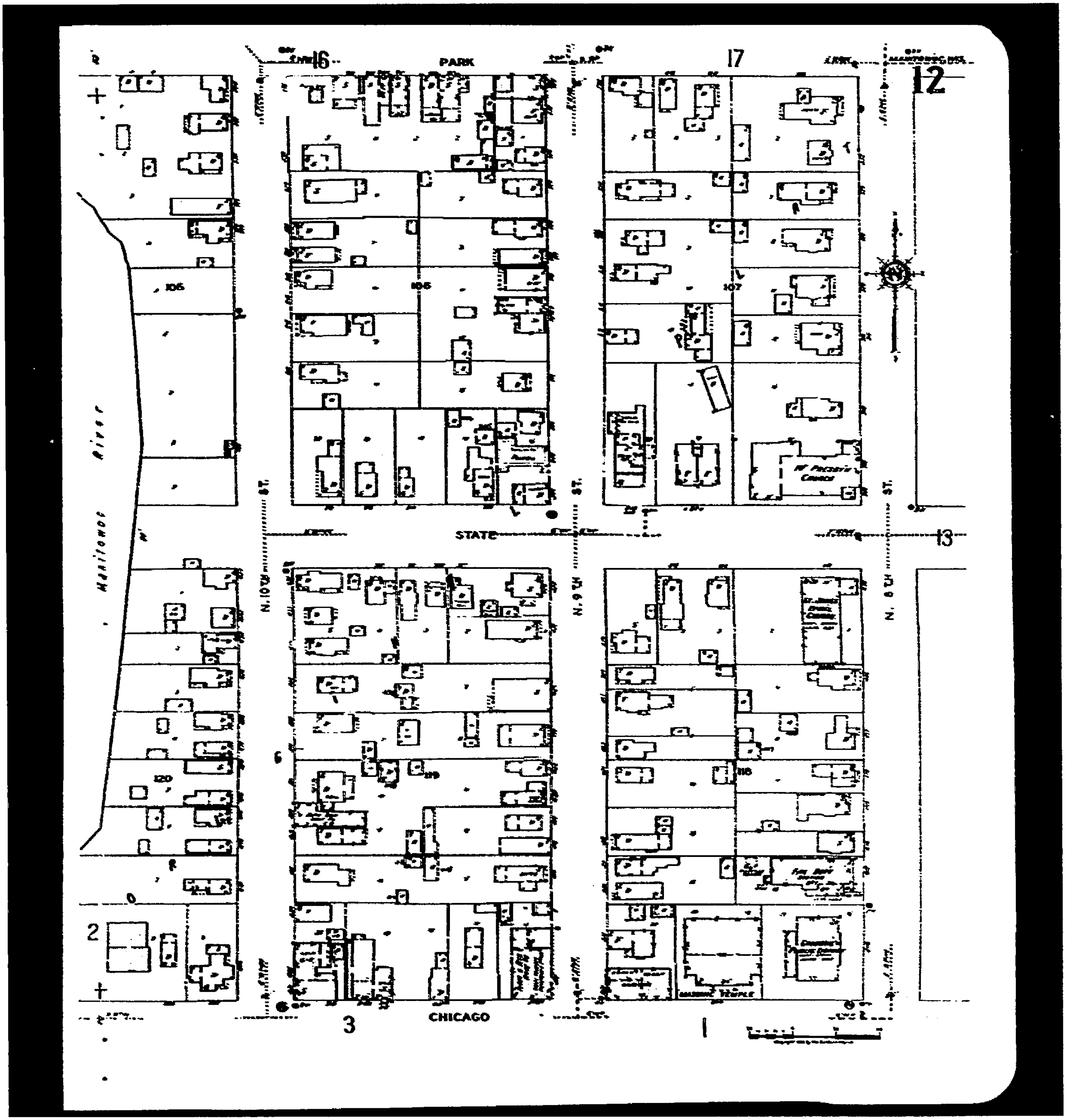

Nov. 1927
MANITOWOC
Wis.
3
12
CHICAGO
BUFFALO
YORK
COMMERCIAL
N. 10TH ST.
N. 9TH ST.
N. 8TH ST.
Manitowoc River
Scale of Feet.
Wisconsin Fuel & Light Co.
Badger Hotel
Auto Sales & Service
Tin Shop
Battery Service
Dick Bros. Brew'g
Salvation Army
Pr't'g
Auto Rep.
Clark Motor Freight Sta.
Filling Station
Veterans Club
Bowling
Hotel
Freight Ho.
Whol. Liquor
Goss Lumber Co.
Lumber Sheds
Garage
Auto Sales & Service
Mach. Shop
Glenn Inn Hotel
Henderson Hoyt Co. Department Store
McMullen & Pitz Constr'n Co.
Planing Mill
Goss Lumber Co.
Auto Sales Room
153
154
155
168
167
166
173
174
175
185
184
183
2
4
5
6
21
508

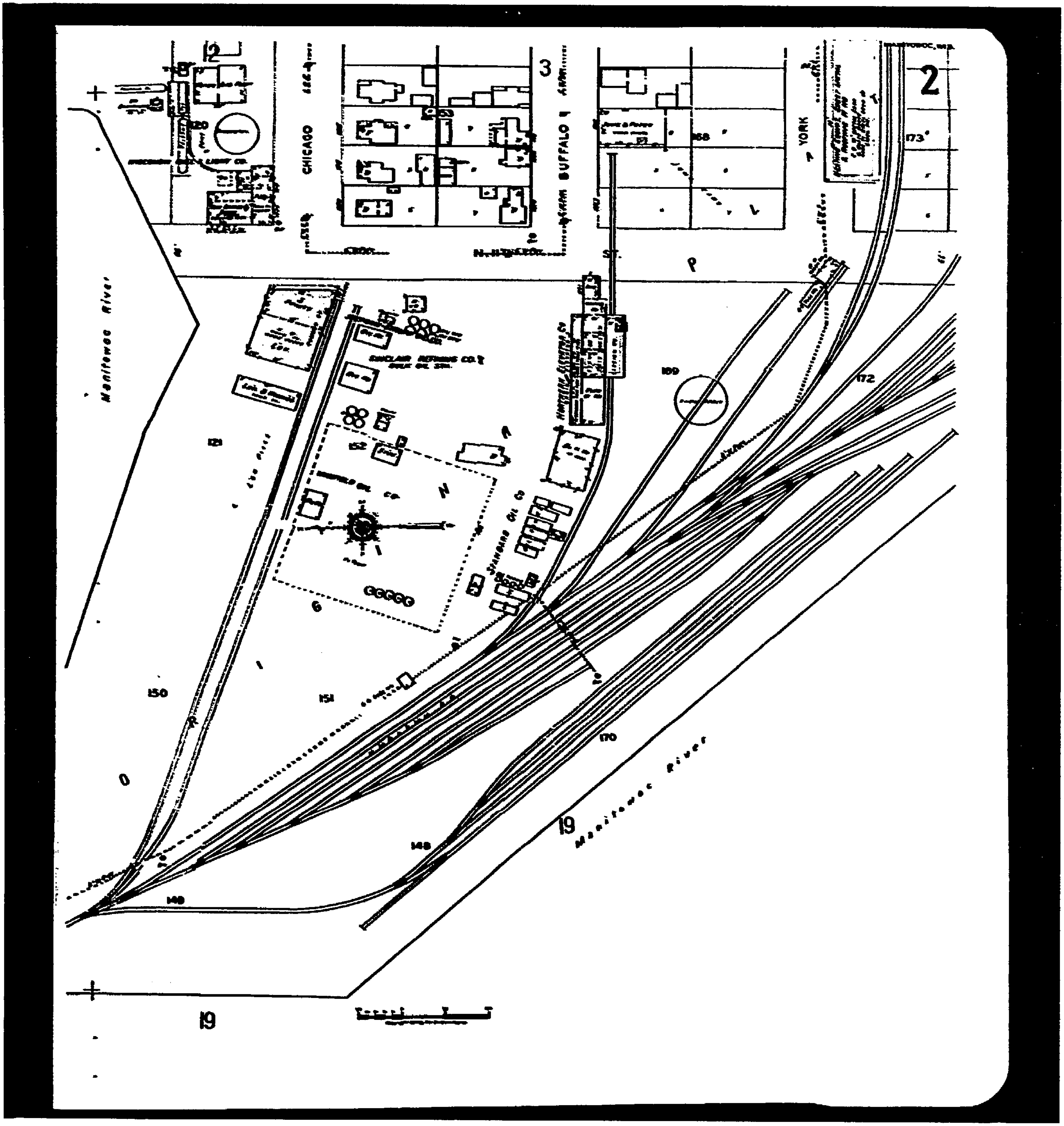


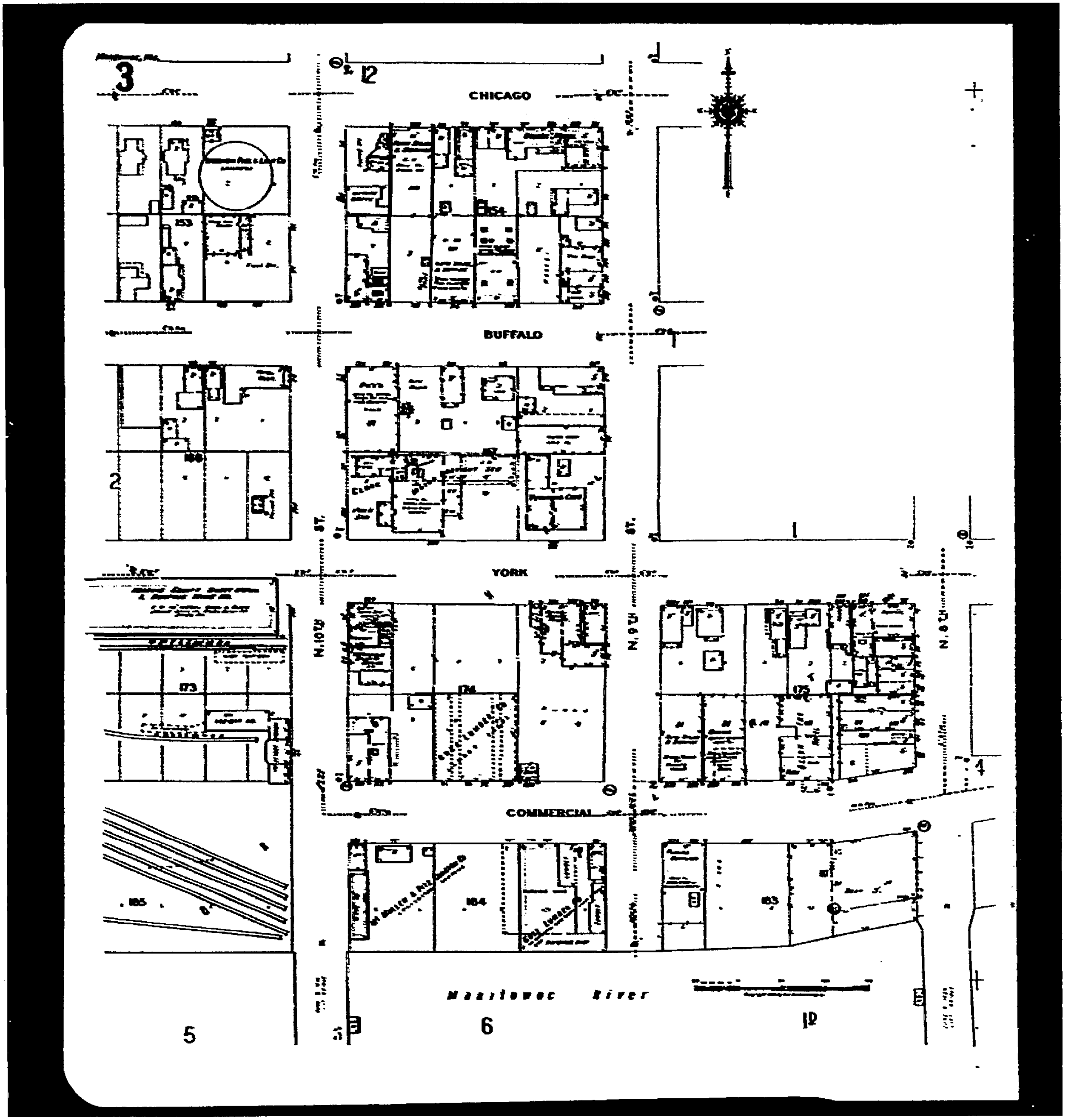
12
PARK
16
17
12
Nov. 1927
MANITOWOC
Wis.
105
106
107
Manitowoc River
N. 10TH ST.
N. 9TH ST.
N. 8TH ST.
STATE
13
1ST PRESBY'N CHURCH
ST. JAMES EPISCL. CHURCH
HOTEL
118
119
120
FIRE DEPT STATION No. 1
CARNEGIE PUBLIC LIBRARY
MASONIC TEMPLE
Scale of Feet
2
CHICAGO
3

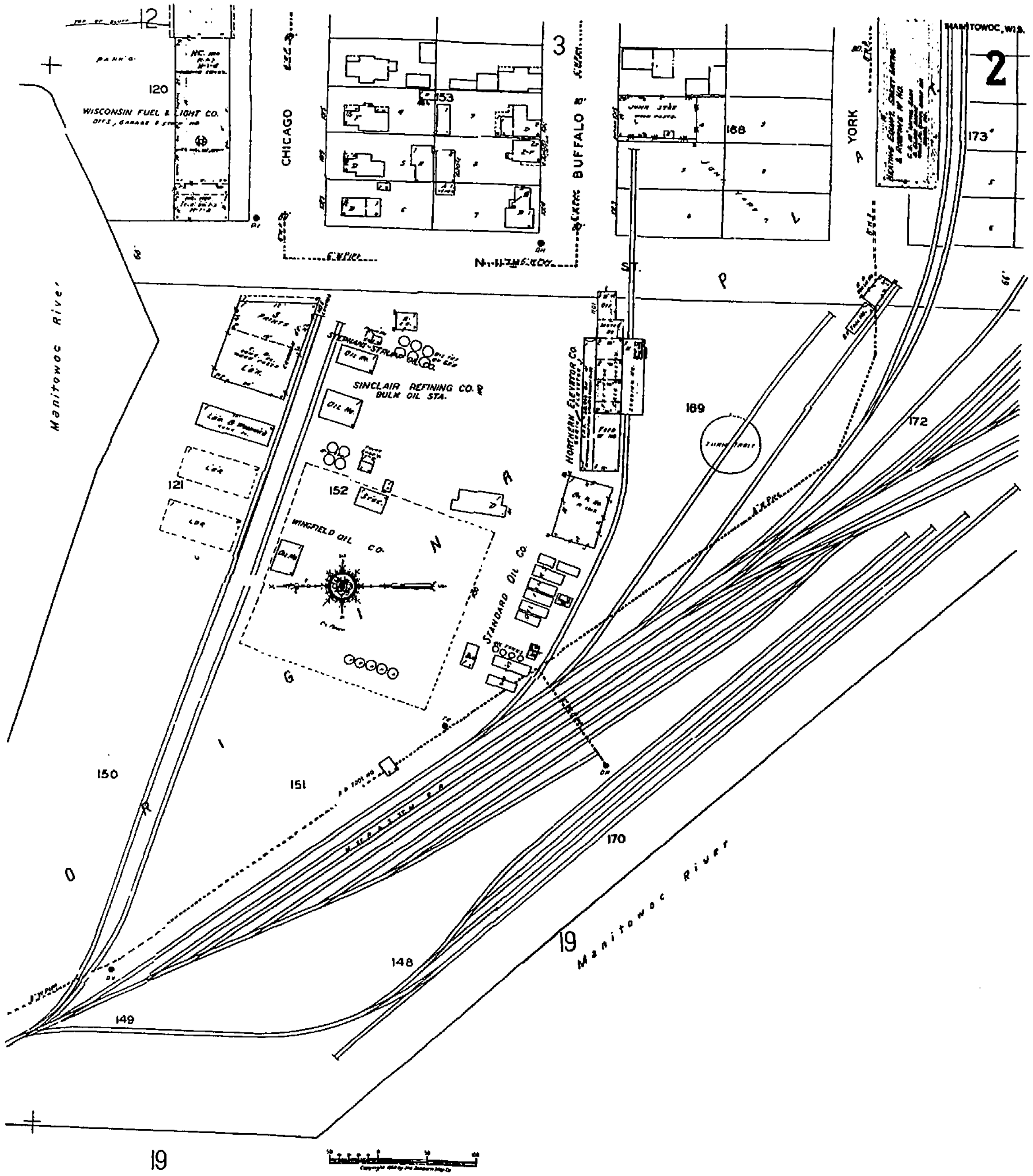


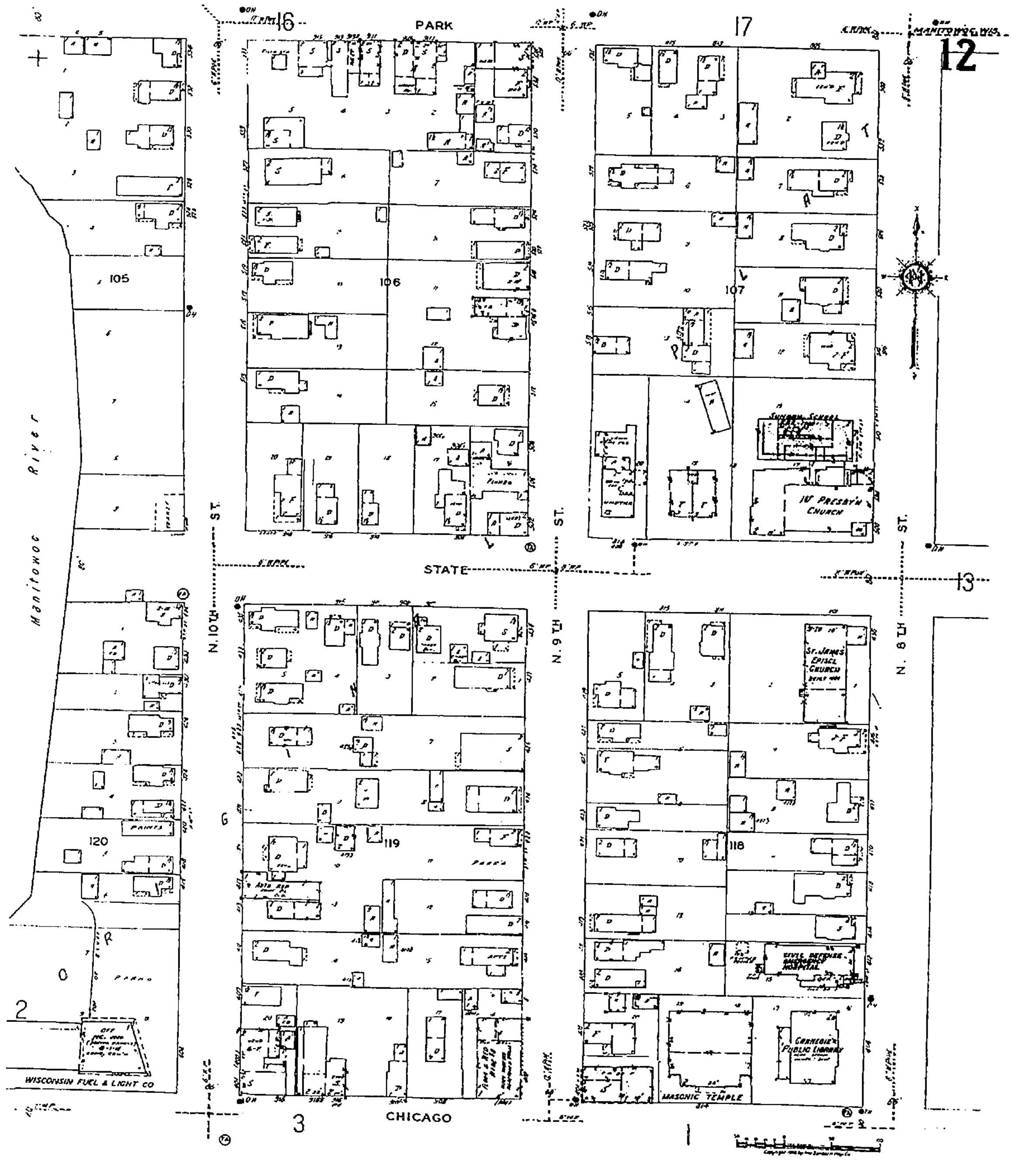
2
Nov. 1927
MANITOWOC
WIS
2
3
Water Gas Plant
Gasometer
Wisconsin Fuel & Light Co.
Gas Plant
Chicago
Buffalo
York
Junk & Paper
Junk
N. 11th St.
Manitowoc River
Sinclair Refining Co.
Bulk Oil Sta
Oil Ho
Shell Oil Co. Inc.
(Fenced)
Northern Elevator Co.
Standard Oil Co.
(Street lines not defined)
Eng Ho.
Turn Table
Grand Trunk R.R.
Dust Ho
Red Arrow Malting Co.
Grain Elevator A & Annex
M. St. P. & S. St. M. R.R. Freight Ho.
Manitowoc River
Swamp
Out Lots
S. 21st St.
Scale of Feet
19
20
21


16
PARK
17
12
106
106
107
Manitowoc River
N. 10TH ST.
N. 9TH ST.
N. 8TH ST.
STATE
13
120
119
118
2
3
CHICAGO
1
MASONIC TEMPLE

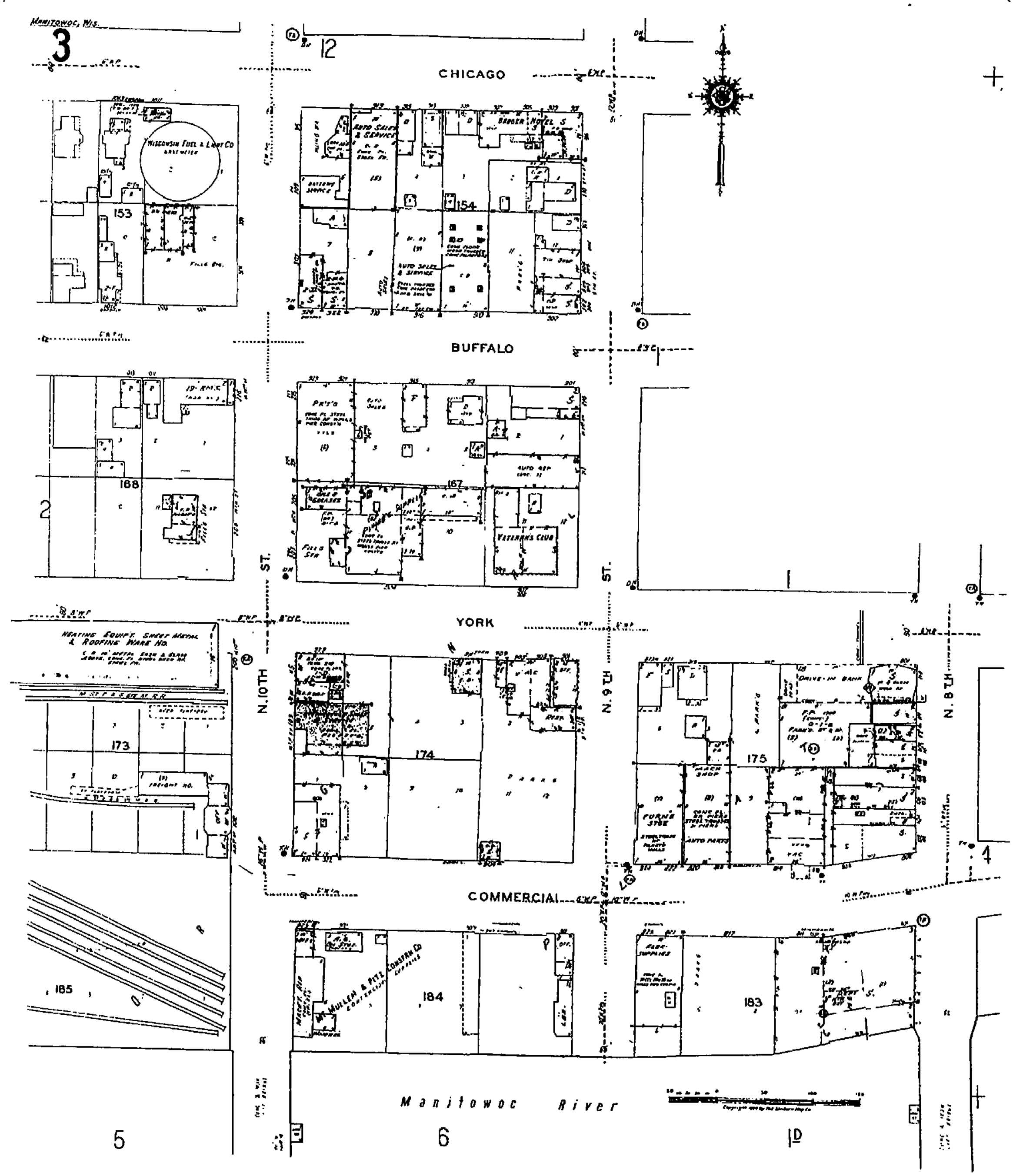

12
3
2
CHICAGO
BUFFALO
YORK
ST.
Manitowoc River
SINCLAIR REFINING CO.
STANDARD OIL CO.
150
151
152
169
172
173
170
148
149
19
Manitowoc River
19


3
12
CHICAGO
BUFFALO
YORK
COMMERCIAL
N. 10TH ST.
N. 9TH ST.
N. 8TH
Manitowoc River
2
4
5
6
10
153
154
166
173
174
175
183
184
185

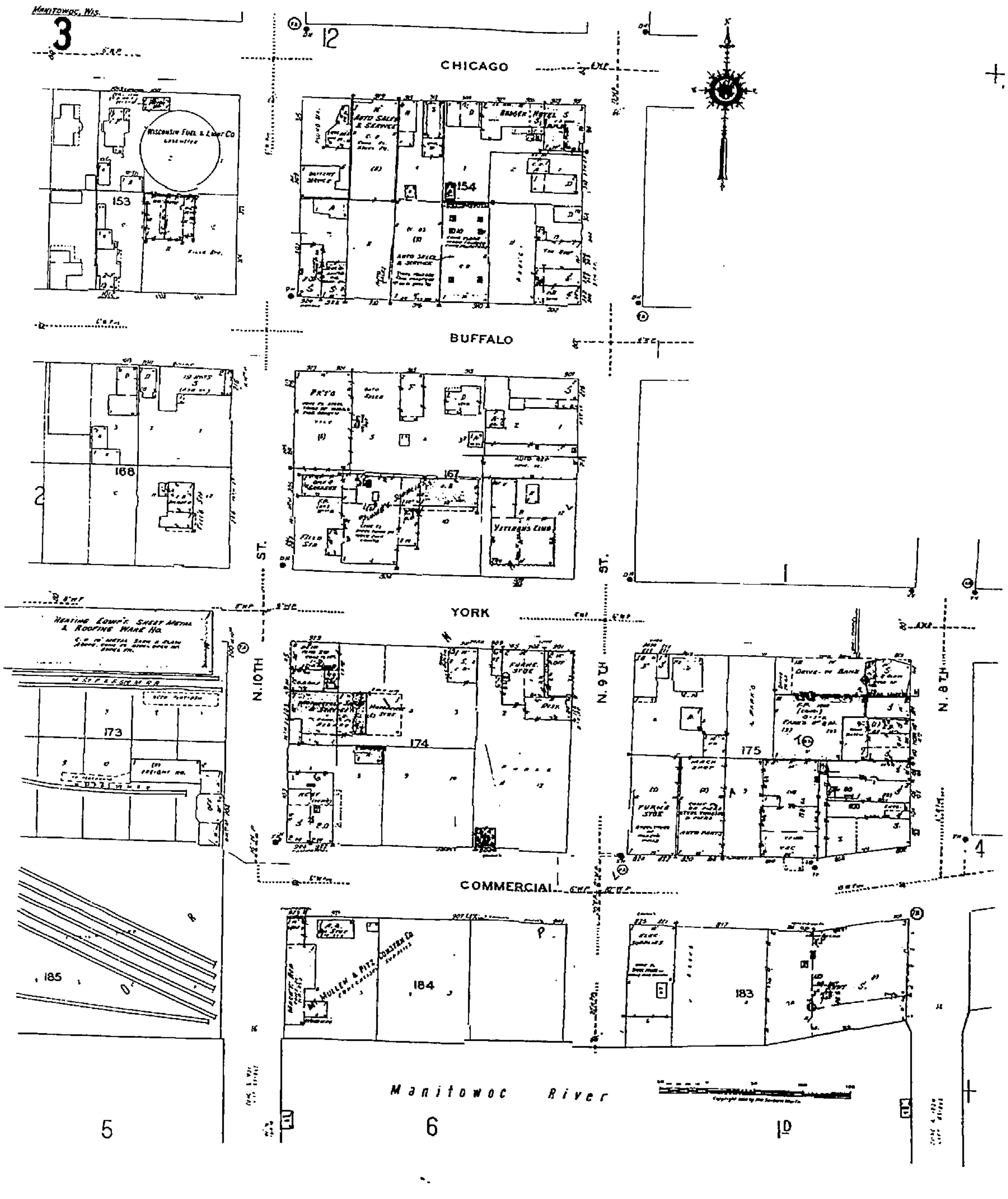

MANITOWOC, WIS.
2
12
3
CHICAGO
BUFFALO
YORK
ST.
WISCONSIN FUEL & LIGHT CO.
120
121
150
151
152
153
148
149
170
168
173
189
172
SINCLAIR REFINING CO. BULK OIL STA.
WINGFIELD OIL CO.
STANDARD OIL CO.
NORTHERN ELEVATOR CO.
TURN TABLE
Manitowoc River
Manitowoc River
19
19



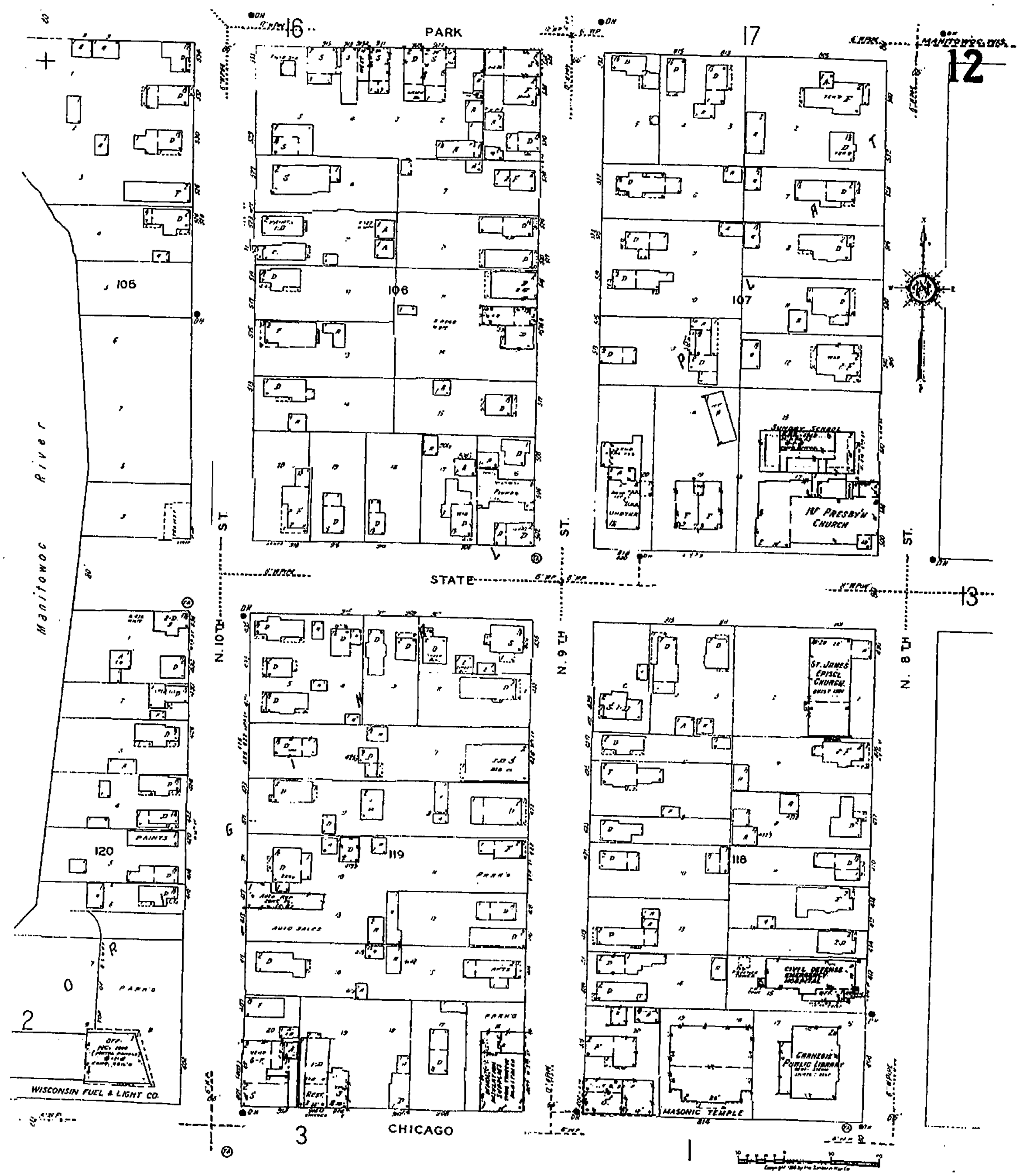
PARK
STATE
CHICAGO
N. 10TH ST.
N. 9TH ST.
N. 8TH ST.
Manitowoc River
MANITOWOC WIS.
12
16
17
13
3
2
1
105
106
107
118
119
120
ST. JAMES EPISC. CHURCH
1ST PRESBY'N CHURCH
SUNDAY SCHOOL
MASONIC TEMPLE
CARNEGIE PUBLIC LIBRARY
CIVIL DEFENSE EMERGENCY HOSPITAL
WISCONSIN FUEL & LIGHT CO



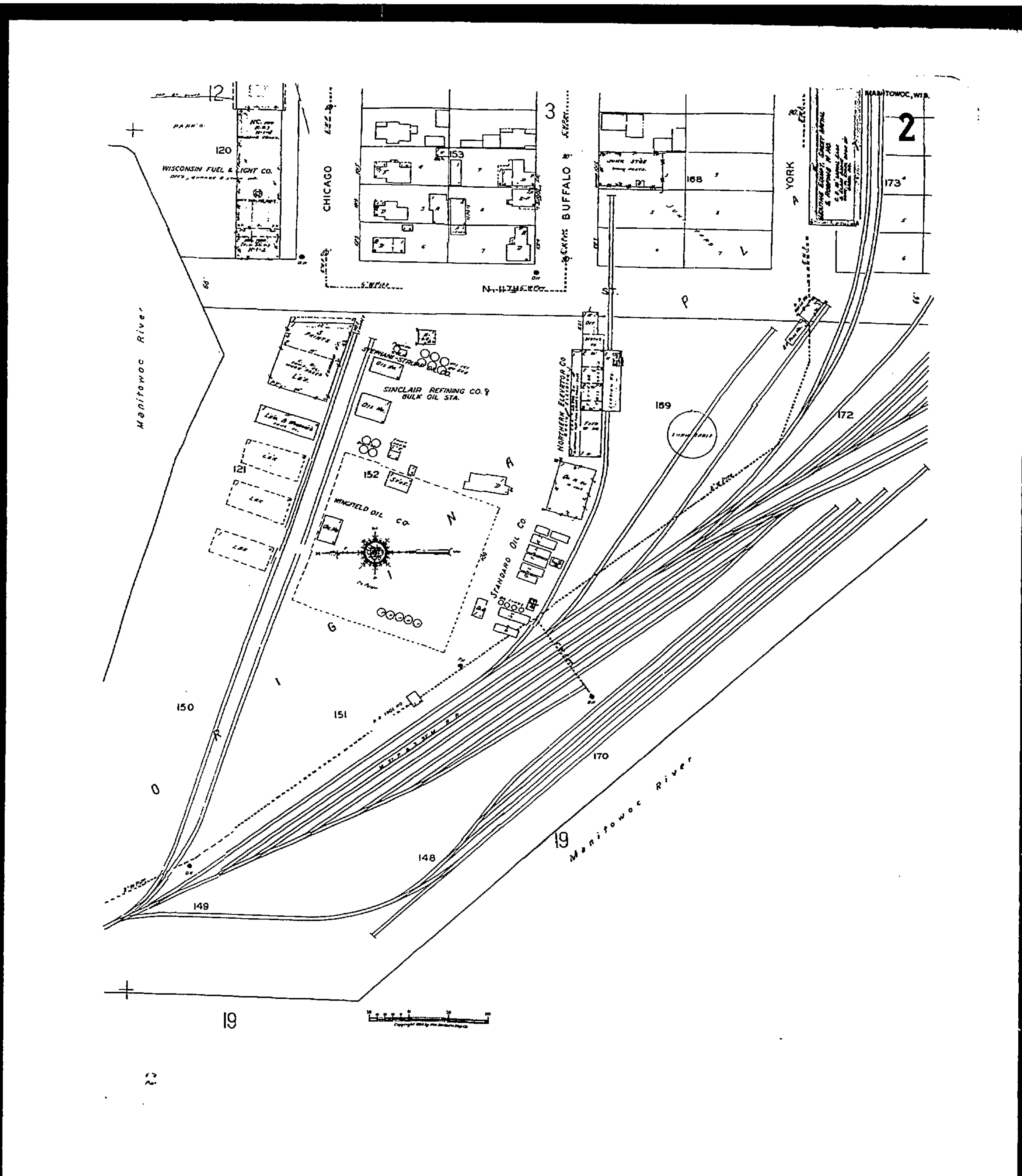
Manitowoc, Wis.
3
12
CHICAGO
BUFFALO
YORK
COMMERCIAL
N. 10TH ST.
N. 9TH ST.
N. 8TH
153
154
168
167
173
174
175
185
184
183
Wisconsin Fuel & Light Co
Veteran's Club
Drive-In Bank
Heating Equip't, Sheet Metal & Roofing Ware Ho.
Auto Sales & Service
Freight Ho.
Furn's Stge
Mach Shop
Auto Parts
Manitowoc River
2
4
5
6
10



Manitowoc, Wis.
3
12
CHICAGO
BUFFALO
YORK
COMMERCIAL
N. 10TH ST.
N. 9TH ST.
N. 8TH
153
154
168
167
173
174
175
185
184
183
Manitowoc River
5
6
10
4
2



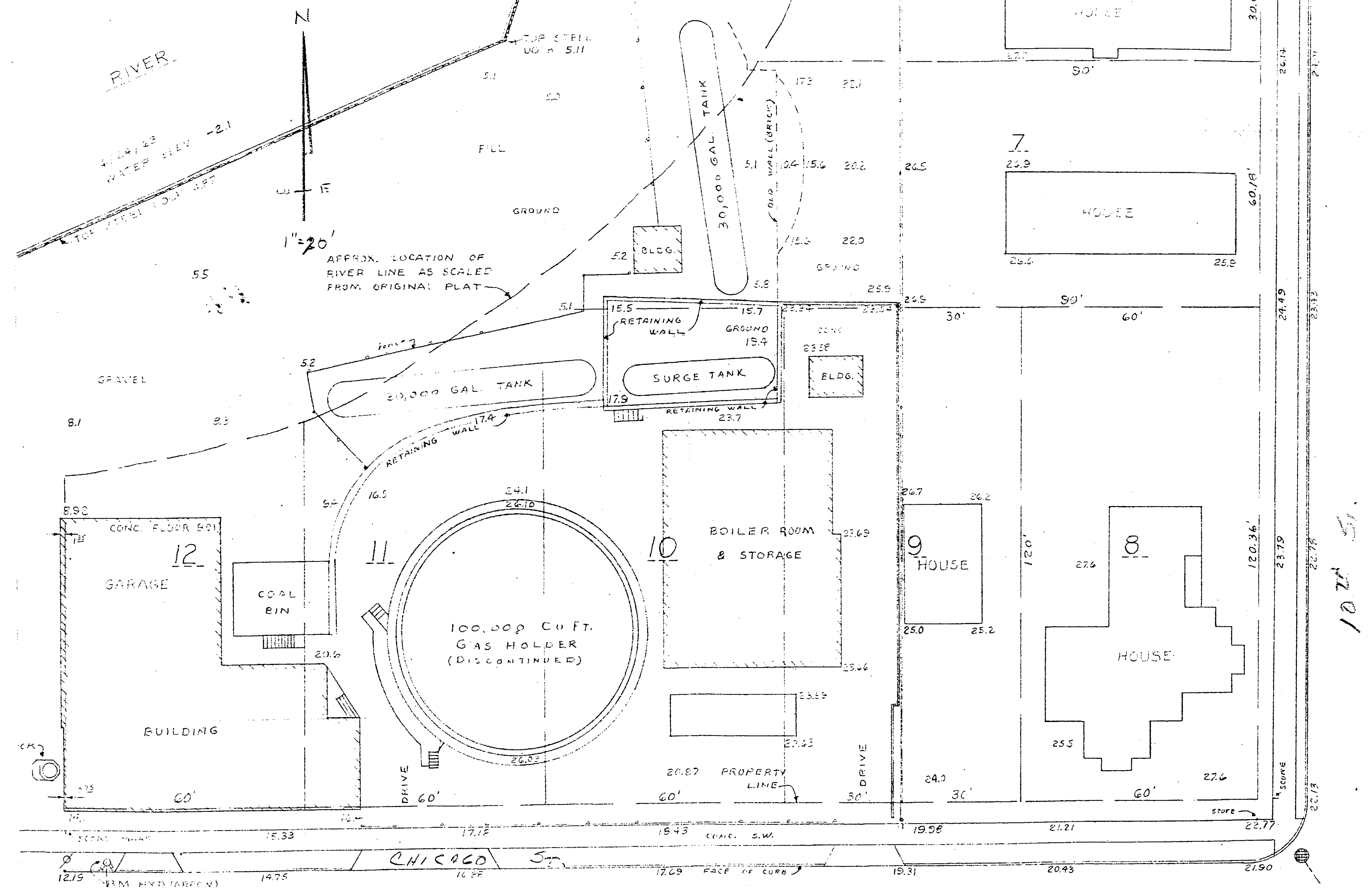
16
PARK
17
12
105
106
107
Manitowoc River
N. 10TH ST.
N. 9TH ST.
N. 8TH ST.
STATE
13
1st PRESBY'N CHURCH
ST. JAMES EPISC'L CHURCH
120
119
118
PAINTS
AUTO SALES
CIVIL DEFENSE EMERGENCY HOSPITAL
CARNEGIE PUBLIC LIBRARY
MASONIC TEMPLE
WISCONSIN FUEL & LIGHT CO.
2
3
1
CHICAGO



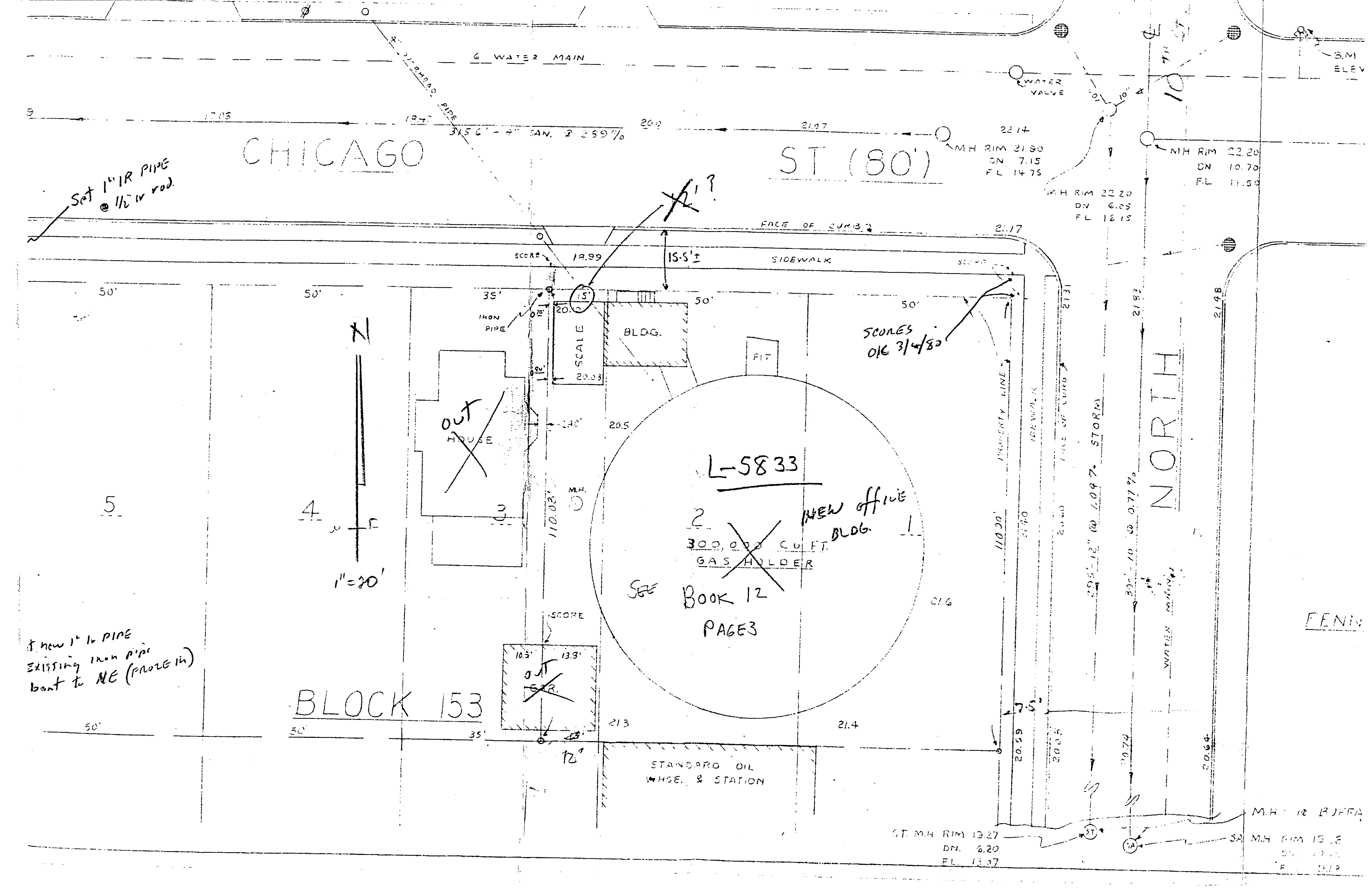
MANITOWOC, WIS.
2
3
12
19
120
WISCONSIN FUEL & LIGHT CO.
CHICAGO
BUFFALO
YORK
ST.
P
168
173
153
Manitowoc River
SINCLAIR REFINING CO.'S BULK OIL STA.
STEPHANS-STRUPP OIL CO.
NORTHERN ELEVATOR CO.
169
172
121
152
WINGFIELD OIL CO.
STANDARD OIL CO.
150
151
170
148
149

APPENDIX A2

HISTORICAL PLANT DRAWINGS



RIVER
WATER ELEV -2.1
TOP STEEL DOCK 5.11
N
E
1"=20'
APPROX. LOCATION OF RIVER LINE AS SCALED FROM ORIGINAL PLAT
FILL
GROUND
GRAVEL
30,000 GAL. TANK
OLD WALL (BRICK)
BLDG.
RETAINING WALL
GROUND
19.4
SURGE TANK
30,000 GAL. TANK
RETAINING WALL
BLDG.
BOILER ROOM & STORAGE
100,000 CU FT. GAS HOLDER (DISCONTINUED)
COAL BIN
CONC. FLOOR 9.01
GARAGE
BUILDING
HOUSE
HOUSE
HOUSE
HOUSE
7
8
9
10
11
12
DRIVE
DRIVE
PROPERTY LINE
CONC. S.W.
FACE OF CURB
CHICAGO ST.
10TH ST.
STORE
90'
90'
60'
30'
120'
120.36'
60.18'
60'
60'
60'
60'
30'
30'
5.5
8.1
9.3
5.2
5.1
5.2
15.5
15.7
17.9
17.4
23.7
16.5
24.1
26.10
26.02
20.6
8.92
23.69
23.66
23.58
23.59
23.63
20.87
26.7
26.2
25.0
25.2
24.0
27.6
25.5
27.6
26.5
26.9
26.6
25.9
25.9
22.0
20.2
15.6
22.77
19.98
21.21
19.31
20.43
21.90
17.69
19.43
17.78
15.33
14.75
12.19
22.13
23.79
24.49
26.14


6 WATER MAIN
CHICAGO
ST (80')
3156' - 4" SAN. @ 2.59%
WATER VALVE
M.H. RIM 21.90
DN 7.15
FL 14.75
M.H. RIM 22.20
DN 6.05
FL 16.15
NH RIM 22.20
DN 10.70
FL 11.50
S.M. ELEV
Set 1" IR PIPE @ 1½" IR rod.
FACE OF CURB
SIDEWALK
15.5'±
SCORE
19.99
IRON PIPE
SCALE
20.03
BLDG.
FIT
SCORES OK 3/4/80
PROPERTY LINE
SIDEWALK
FACE OF CURB
STORM
295' - 12" @ 0.47%
300' - 10 @ 0.77%
WATER MAIN
NORTH
OUT
HOUSE
M.H.
110.03'
110.00'
20.5
L-5833
NEW office BLDG.
300,000 CU. FT.
GAS HOLDER
SEE BOOK 12 PAGE3
21.6
21.4
21.3
7.5'
1
2
3
4
5
N
1" = 20'
SCORE
OUT
GAR.
10.3'
13.3'
12'
BLOCK 153
STANDARD OIL WHSE. & STATION
Set new 1" Ir PIPE Existing iron pipe bent to NE (froze in)
ST. M.H. RIM 13.27
DN. 6.20
FL. 13.07
M.H. in BUFFA
SA M.H. RIM 13
FENN
50'
35'
20.59
20.05
20.74
20.64
21.31
21.83
21.98
21.17
21.40
21.07
22.14
20.0
19.47
17.05

APPENDIX B

EDR INFORMATION AND OTHER SITE VICINITY INFORMATION

APPENDIX B1

EDR RADIUS MAP AND REPORT

EDR® Environmental
Data Resources Inc

The EDR Radius Map
with GeoCheck®

Former Wisconsin Fuel and Light
North 11th Street/Chicago Street
Manitowoc, WI 54220

Inquiry Number: 1831689.2s

January 10, 2007

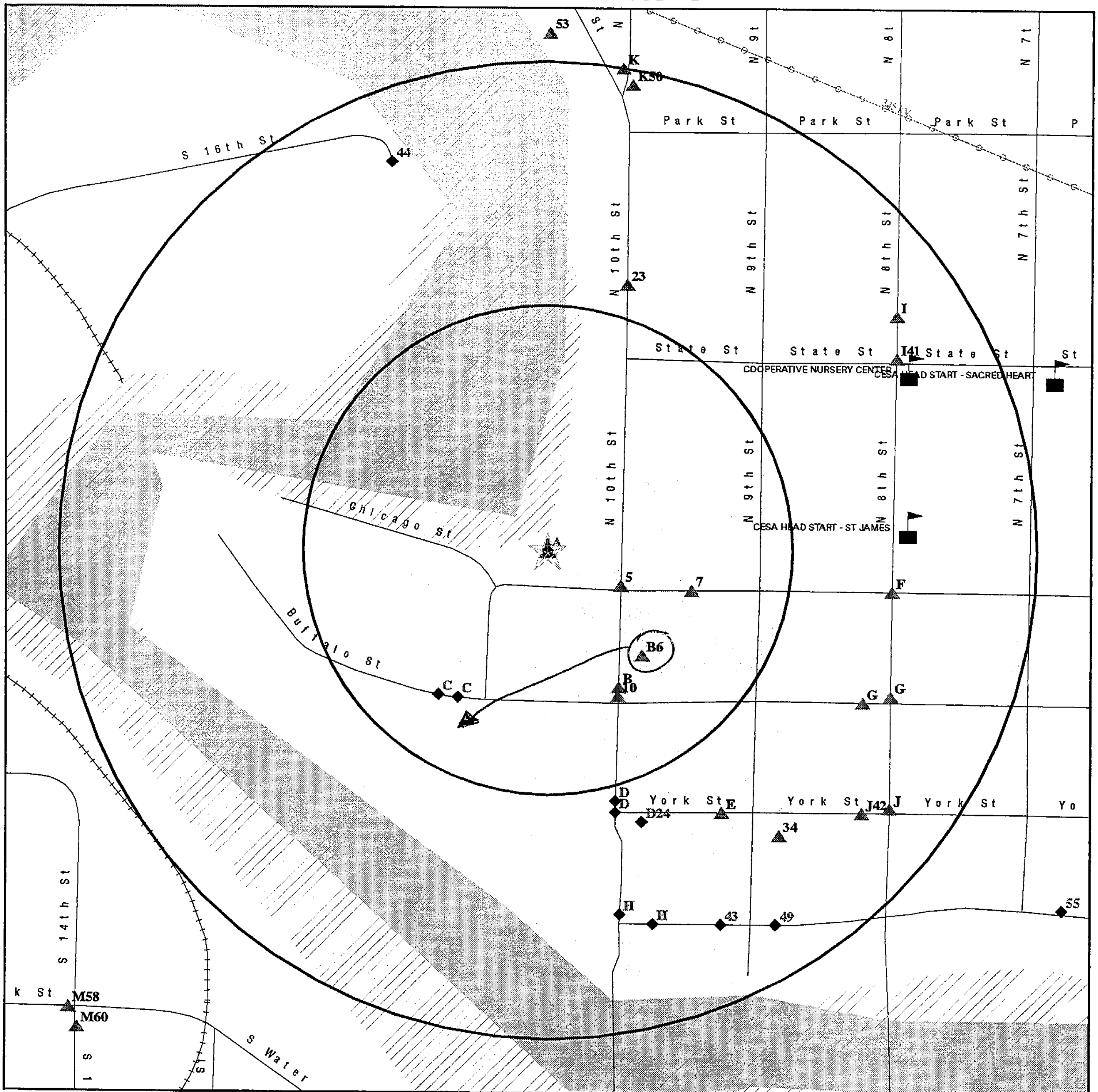
The Standard in
Environmental Risk
Management Information

440 Wheelers Farms Road
Milford, Connecticut 06461

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

DETAIL MAP - 1831689.2s



0 1/16 1/8 1/4 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Former Wisconsin Fuel and Light	CLIENT:	Natural Resource Technology
ADDRESS:	North 11th Street/Chicago Street Manitowoc WI 54220	CONTACT:	Brian Hennings
		INQUIRY #:	1831689.2s
LAT/LONG:	44.0957 / 87.6613	DATE:	January 10, 2007 11:43 am

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

NORTH 11TH STREET/CHICAGO STREET
MANITOWOC, WI 54220

COORDINATES

Latitude (North):	44.095700 - 44˚ 5' 44.5"
Longitude (West):	87.661300 - 87˚ 39' 40.7"
Universal Tranverse Mercator:	Zone 16
UTM X (Meters):	447064.6
UTM Y (Meters):	4882498.5
Elevation:	597 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	44087-A6 MANITOWOC, WI
Most Recent Revision:	1973

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following records. For more information on this property see page 6 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
WISCONSIN FUEL AND LIGHT CO (WPCS 402 N. TENTH ST. MANITOWOC, WI 54220	Manufactured Gas Plants	N/A
WPSC MANITOWOC MGP 402 N 10TH ST. MANITOWOC, WI 54220	CERCLIS	WIN000509949
WIFUEL AND LIGHT 10TH ST / CHICAGO MANITOWOC, WI	WI WRRSER	N/A
WISCONSIN FUEL AND LIGHT CO 402 N 10TH ST MANITOWOC, WI 54220	RCRA-SQG FINDS WI Spills WI ERP BROWNFIELDS BRRTS SHWIMS	WID007946510

EXECUTIVE SUMMARY

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

FEDERAL RECORDS

NPL — National Priority List
Proposed NPL — Proposed National Priority List Sites
Delisted NPL — National Priority List Deletions
NPL RECOVERY — Federal Superfund Liens
CORRACTS — Corrective Action Report
RCRA-TSDF — Resource Conservation and Recovery Act Information
RCRA-LQG — Resource Conservation and Recovery Act Information
ERNS — Emergency Response Notification System
HMIRS — Hazardous Materials Information Reporting System
US ENG CONTROLS — Engineering Controls Sites List
US INST CONTROL — Sites with Institutional Controls
DOD — Department of Defense Sites
FUDS — Formerly Used Defense Sites
US BROWNFIELDS — A Listing of Brownfields Sites
CONSENT — Superfund (CERCLA) Consent Decrees
ROD — Records Of Decision
UMTRA — Uranium Mill Tailings Sites
ODI — Open Dump Inventory
TRIS — Toxic Chemical Release Inventory System
TSCA — Toxic Substances Control Act
FTTS — FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
SSTS — Section 7 Tracking Systems
ICIS — Integrated Compliance Information System
PADS — PCB Activity Database System
MLTS — Material Licensing Tracking System
MINES — Mines Master Index File
RAATS — RCRA Administrative Action Tracking System

STATE AND LOCAL RECORDS

SHWS — Hazard Ranking List
SWF/LF — List of Licensed Landfills
WI MANIFEST — Hazardous Waste Manifest Data
AGSPILLS — Agricultural Spill Cases
CRS — Closed Remediation Sites
DRYCLEANERS — Five Star Recognition Program Sites
BEAP — Brownfields Environmental Assessment Program
AIRS — Air Permit Program Listing
TIER 2 — Tier 2 Facility Listing
LEAD — Lead Inspection Data

TRIBAL RECORDS

INDIAN RESERV — Indian Reservations

EXECUTIVE SUMMARY

INDIAN LUST............... Leaking Underground Storage Tanks on Indian Land
INDIAN UST................ Underground Storage Tanks on Indian Land

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

FEDERAL RECORDS

CERCLIS-NFRAP: Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

A review of the CERC-NFRAP list, as provided by EDR, and dated 10/10/2006 has revealed that there is 1 CERC-NFRAP site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
RED ARROW PRODUCTS CO LLC	***1226 SO WATER STREET***	***1/4 - 1/2SSW***	***54***	***118***

RCRAInfo: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System(RCRIS). The database includes selective information on sites which generate, transport, store , treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month Large quantity generators generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

A review of the RCRA-SQG list, as provided by EDR, and dated 06/13/2006 has revealed that there are 13 RCRA-SQG sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
JAEGER BAKERY	***308 N 10TH ST***	***0 - 1/8 SSE***	***B9***	***26***
MANITOWOC PLUMBING SUPPLY	***924 YORK ST***	***1/8 - 1/4SE***	***E25***	***68***
KWIK TRIP INC 637	***401 N 8TH ST***	***1/8 - 1/4E***	***F28***	***79***

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
JACKSON WALTER L ESTATE	*821 BUFFALO ST*	*1/8 - 1/4 ESE*	*G30*	*80*
WISCONSIN BELL INC PN0506	*820 BUFFALO ST*	*1/8 - 1/4 ESE*	*G33*	*84*
DRAMM CORP	*200 N 19TH ST*	*1/8 - 1/4 SE*	*34*	*84*
FIRST LUTHERAN CHURCH	*521 N 8TH ST*	*1/8 - 1/4 NE*	*I46*	*102*
MOBIL ONE STOP	*620 N WATER ST*	*1/8 - 1/4 N*	*K52*	*111*

Lower Elevation	Address	Dist / Dir	Map ID	Page
HOLMES OIL	*1110 BUFFALO ST*	*0 - 1/8 SSW*	*C13*	*37*
COLORCRAFT GRAPHIC ARTS INC	*211 N 10TH ST*	*1/8 - 1/4 SSE*	*D17*	*57*
QUICK LUBE	*204 N 10TH ST*	*1/8 - 1/4 SSE*	*D21*	*63*
RBA INC	*300 S 16TH ST*	*1/8 - 1/4 NNW*	*44*	*101*
WISCONSIN MARITIME MUSEUM INC	*75 MARITIME DR*	*1/8 - 1/4 SSE*	*49*	*106*

STATE AND LOCAL RECORDS

WI ERP: Emergency Repair Program Database. Non - LUST Sites with Contaminated Soil and/or GW. Often these are historic releases to the environment.

A review of the WI ERP list, as provided by EDR, and dated 09/30/2006 has revealed that there are 12 WI ERP sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
WCL	*SW CORNER 11TH ST / B*	*0 - 1/8 SE*	*B6*	*18*
FIRST PRESBYTERIAN CHURCH	502 N 8TH ST	1/8 - 1/4 ENE	I41	98
MOBIL ONE-STOP	*620 N WATER ST*	*1/4 - 1/2 N*	*53*	*111*
PROFESSIONAL ARTS BLDG	*605 YORK ST*	*1/4 - 1/2 ESE*	*L57*	*135*
THOR AUTO BODY	*603 YORK ST*	*1/4 - 1/2 ESE*	*L59*	*144*
RUZEKS STANDARD SERVICE	*732 N 11TH ST*	*1/4 - 1/2 N*	*62*	*169*
MIRRO CO PLT 1	*1616 WOLLMER, P O BOX 1*	*1/4 - 1/2 WSW*	*67*	*206*
FIRESTONE BLDG (FORMER)	1011 WASHINGTON ST	1/4 - 1/2 S	72	242

Lower Elevation	Address	Dist / Dir	Map ID	Page
WCL	200 N 10TH ST	1/8 - 1/4 SSE	D22	64
RIDGE MOTOR SUPPLY CO	*1011 FRANKLIN ST*	*1/4 - 1/2 S*	*61*	*163*
MANITOWOC ENGINEERING CO	*500 S 16TH ST*	*1/4 - 1/2 W*	*63*	*181*
WCI COMMERCIAL REFRIGERATION	*621 QUAY ST*	*1/4 - 1/2 SE*	*69*	*223*

WI WDS: The Registry was created by the DNR to serve as a comprehensive listing of all sites where solid or hazardous wastes have been or may have been deposited.

A review of the WI WDS list, as provided by EDR, and dated 11/01/2000 has revealed that there is 1 WI WDS site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
WIS ALUMINUM FOUNDRY	838 S 16TH ST	1/4 - 1/2 SW	O74	246

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Department of Natural Resource's LUST Database.

A review of the LUST list, as provided by EDR, and dated 09/30/2006 has revealed that there are 26 LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
JAEGER BAKERY Facility Status: CLOSED	*308 N 10TH ST*	*0 - 1/8 SSE*	*B9*	*26*
Not reported Facility Status: CLOSED	*401 N 8TH ST*	*1/8 - 1/4 E*	*F27*	*71*
DICK BROTHERS BAKERY Facility Status: CLOSED	306 N 8TH ST	1/8 - 1/4 ESE	G38	91
ASSOCIATED BANK (FORMER) Facility Status: CLOSED	204 N 8TH ST	1/8 - 1/4 SE	J47	104
MOBIL ONE-STOP Facility Status: CLOSED	*620 N WATER ST*	*1/4 - 1/2 N*	*53*	*111*
VALLESKEY MARITAL TRUST Facility Status: CLOSED	*1310 CLARK ST*	*1/4 - 1/2 SW*	*M58*	*140*
SCHLEIS AUTO ELECTRIC Facility Status: CLOSED Facility Status: CLOSED	*803 S 14TH ST*	*1/4 - 1/2 SW*	*M60*	*152*
RUZEKS STANDARD SERVICE Facility Status: CLOSED	*732 N 11TH ST*	*1/4 - 1/2 N*	*62*	*169*
STEFFEN'S CITY SALES & SERVICE Facility Status: CLOSED	*1317 FRANKLIN ST*	*1/4 - 1/2 SSW*	*66*	*204*
TOM'S STANDARD SERVICE Facility Status: CLOSED	*734 N 8TH ST*	*1/4 - 1/2 NNE*	*68*	*219*
SWETLIK SHELL Facility Status: CLOSED	802 N 11TH	1/4 - 1/2 N	71	241
BOELTER'S JEWELERS Facility Status: CLOSED	*1106 WASHINGTON ST*	*1/4 - 1/2 S*	*73*	*244*
WISCONSIN ALUMINUM FOUNDRY Facility Status: CLOSED	*838 S 16TH ST*	*1/4 - 1/2 SW*	*O75*	*247*
LLOYDS PHOTO & VIDEO Facility Status: CLOSED	*1201 WASHINGTON ST*	*1/4 - 1/2 SSW*	*76*	*252*
QUALITY Q-MART Facility Status: CLOSED	*802 HURON AVE*	*1/4 - 1/2 NNE*	*77*	*259*

Lower Elevation	Address	Dist / Dir	Map ID	Page
HOLMES OIL CORP Facility Status: CLOSED	*1110 BUFFALO ST*	*0 - 1/8 SSW*	*C12*	*31*
COLOR CRAFT GRAPHIC ARTS INC Facility Status: CLOSED	*211 N 10TH ST*	*1/8 - 1/4 SSE*	*D19*	*58*
BADGER CYCLE Facility Status: CLOSED	*109 N 10TH ST*	*1/8 - 1/4 SSE*	*H36*	*85*
Not reported Facility Status: CLOSED	*17 MARITIME DR*	*1/8 - 1/4 SSE*	*H39*	*93*

EXECUTIVE SUMMARY

Lower Elevation	Address	Dist / Dir	Map ID	Page
WATERFORD PLACE Facility Status: CLOSED	N SIDE MARITIME DR BETW	1/4 - 1/2 SE	55	127
PIETROSKE BODY SHOP Facility Status: CLOSED	***901 QUAY***	***1/4 - 1/2 SSE***	***56***	***128***
RIDGE MOTOR SUPPLY CO Facility Status: CLOSED	***1011 FRANKLIN ST***	***1/4 - 1/2 S***	***61***	***163***
MANITOWOC ENGINEERING CO Facility Status: CLOSED	***500 S 16TH ST***	***1/4 - 1/2 W***	***63***	***181***
PIETROSKE PROPERTY Facility Status: CLOSED	***822 FRANKLIN ST***	***1/4 - 1/2 SSE***	***N64***	***196***
MANITOWOC SAFETY BLDG Facility Status: CLOSED Facility Status: CLOSED	***817 FRANKLIN ST***	***1/4 - 1/2 SSE***	***N65***	***198***
MANITOWOC MARINA SAILBOATS INC Facility Status: CLOSED	***425 MARITIME DR***	***1/4 - 1/2 E***	***70***	***232***

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Commerces' List: All Underground Storage Tanks Except for Fuel Oil.

A review of the UST list, as provided by EDR, and dated 10/06/2006 has revealed that there are 23 UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
Not reported	402 N 10TH ST	0 - 1/8 ESE	5	17
Not reported	950 CHICAGO ST	0 - 1/8 ESE	7	23
Not reported	315 N 10TH ST	0 - 1/8 SSE	B8	24
Not reported	306 N 10TH ST	0 - 1/8 SSE	10	29
Not reported	533 N 10TH ST	1/8 - 1/4 NNE	23	66
Not reported	924 YORK ST	1/8 - 1/4 SE	E26	70
Not reported	***401 N 8TH ST***	***1/8 - 1/4 E***	***F27***	***71***
Not reported	821 BUFFALO ST	1/8 - 1/4 ESE	G29	80
Not reported	820 BUFFALO ST	1/8 - 1/4 ESE	G32	83
Not reported	306 N 8TH ST	1/8 - 1/4 ESE	G37	90
Not reported	822 YORK	1/8 - 1/4 SE	J42	99
Not reported	521 N 8TH ST	1/8 - 1/4 NE	I45	101
Not reported	205 N 8TH ST	1/8 - 1/4 SE	J48	106
Not reported	612 N WATER ST	1/8 - 1/4 N	K50	107
Not reported	620 N WATER ST	1/8 - 1/4 N	K51	109

Lower Elevation	Address	Dist / Dir	Map ID	Page
Not reported	1110 BUFFALO ST	0 - 1/8 SSW	C11	30
Not reported	1114 BUFFALO ST	0 - 1/8 SW	C15	49
Not reported	211 N 10TH ST	1/8 - 1/4 SSE	D18	58
Not reported	204 N 10TH ST	1/8 - 1/4 SSE	D20	60
Not reported	204 N 1OTH ST	1/8 - 1/4 SSE	D24	68
Not reported	109 N 10TH	1/8 - 1/4 SSE	H35	85
Not reported	***17 MARITIME DR***	***1/8 - 1/4 SSE***	***H39***	***93***
Not reported	50 MARITIME DR	1/8 - 1/4 SSE	43	100

EXECUTIVE SUMMARY

LAST: A listing of leaking aboveground storage tank sites.

A review of the LAST list, as provided by EDR, and dated 10/02/2006 has revealed that there is 1 LAST site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
HOLMES OIL CORP	*1110 BUFFALO ST*	*0 - 1/8 SSW*	*C12*	*31*

AST: The Aboveground Storage Tank database contains registered ASTs. The data come from the Department of Industry, Labor & Human Resources' List: All Aboveground Storage Tanks Except for Fuel Oil.

A review of the AST list, as provided by EDR, and dated 10/06/2006 has revealed that there are 4 AST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
Not reported	820 BUFFALO ST	1/8 - 1/4 ESE	G31	81

Lower Elevation	Address	Dist / Dir	Map ID	Page
Not reported	1114 BUFFALO ST	0 - 1/8 SW	C14	38
Not reported	1115 BUFFALO ST	0 - 1/8 SW	C16	51
Not reported	17 MARITIME DR	1/8 - 1/4 SSE	H40	97

AUL: Date a deed restriction is recorded at the Register of Deeds office for a property. Extent of soil contamination is known but impracticable to remove now or an engineering control is required to be maintained or NR720 industrial stds are applied. Restricts property use or requires future actions.

A review of the AUL list, as provided by EDR, and dated 09/30/2006 has revealed that there are 16 AUL sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
WCL	*SW CORNER 11TH ST / B*	*0 - 1/8 SE*	*B6*	*18*
MOBIL ONE-STOP	*620 N WATER ST*	*1/4 - 1/2 N*	*53*	*111*
PROFESSIONAL ARTS BLDG	*605 YORK ST*	*1/4 - 1/2 ESE*	*L57*	*135*
VALLESKEY MARITAL TRUST	*1310 CLARK ST*	*1/4 - 1/2 SW*	*M58*	*140*
THOR AUTO BODY	*603 YORK ST*	*1/4 - 1/2 ESE*	*L59*	*144*
SCHLEIS AUTO ELECTRIC	*803 S 14TH ST*	*1/4 - 1/2 SW*	*M60*	*152*
RUZEKS STANDARD SERVICE	*732 N 11TH ST*	*1/4 - 1/2 N*	*62*	*169*
MIRRO CO PLT 1	*1616 WOLLMER, P O BOX 1*	*1/4 - 1/2 WSW*	*67*	*206*
LLOYDS PHOTO & VIDEO	*1201 WASHINGTON ST*	*1/4 - 1/2 SSW*	*76*	*252*
QUALITY Q-MART	*802 HURON AVE*	*1/4 - 1/2 NNE*	*77*	*259*

Lower Elevation	Address	Dist / Dir	Map ID	Page
HOLMES OIL CORP	*1110 BUFFALO ST*	*0 - 1/8 SSW*	*C12*	*31*
BADGER CYCLE	*109 N 10TH ST*	*1/8 - 1/4 SSE*	*H36*	*85*
Not reported	*17 MARITIME DR*	*1/8 - 1/4 SSE*	*H39*	*93*
PIETROSKE BODY SHOP	*901 QUAY*	*1/4 - 1/2 SSE*	*56*	*128*
MANITOWOC SAFETY BLDG	*817 FRANKLIN ST*	*1/4 - 1/2 SSE*	*N65*	*198*
WCI COMMERCIAL REFRIGERATION	*621 QUAY ST*	*1/4 - 1/2 SE*	*69*	*223*

EXECUTIVE SUMMARY

VCP: The Voluntary Party Liability Exemption is an elective environmental cleanup program. Interested persons who meet the definition of "voluntary party" are eligib le to apply. A "voluntary party" is any person who submits an application and pays all the necessary fees.

A review of the VCP list, as provided by EDR, and dated 09/30/2006 has revealed that there are 2 VCP sites within approximately 0.5 miles of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
RIDGE MOTOR SUPPLY CO	*1011 FRANKLIN ST*	*1/4 - 1/2 S*	*61*	*163*
MANITOWOC ENGINEERING CO	*500 S 16TH ST*	*1/4 - 1/2 W*	*63*	*181*

BROWNFIELDS: A listing of brownfields sites included in the BRRTS database. Brownfields are abandoned, idle or underused commercial or industrial properties, where the expansion or redevelopment is hindered by real or perceived contamination. Brownfields vary in size, location, age, and past use -- they can be anything from a five-hundred acre automobile assembly plant to a small, abandoned corner gas station.

A review of the BROWNFIELDS list, as provided by EDR, and dated 09/30/2006 has revealed that there is 1 BROWNFIELDS site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
MANITOWOC ENGINEERING CO	*500 S 16TH ST*	*1/4 - 1/2 W*	*63*	*181*

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

Site Name	Database(s)
MANITOWOC PUBLIC UTILITIES	SHWS
CITY OF MANITOWOC (OLD BOAT RAMP)	SHWS
MANITOWOC BOAT RAMP	CERC-NFRAP
MANITOWOC RAPIDS TN	SWF/LF, SHWIMS
SPRINGER PROPERTY	LUST
TUNE UP SHOP	RCRA-SQG, FINDS, LUST, SHWIMS
DEAN BRENNAN TRANSPORT INC	LUST, SHWIMS
1500 HWY 310	UST
7416 COUNTY HWY CR	UST
1500 HWY 310	AST
CANADIAN NATIONAL RR	WI Spills, WI ERP
WI MARITIME MUSEUM (FORMER SMALLEY MFG)	WI ERP, BROWNFIELDS, BRRTS, SHWIMS
WANEK BROTHERS CONST CO	WI ERP, SHWIMS
LAKEVIEW PROPERTY	WI ERP
MANITOWOC B GROUNDWATER	WI ERP
MANITOWOC CTY LF (OLD BOAT RAMP)*	WI ERP, SHWIMS

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FEDERAL RECORDS								
NPL		1.000	0	0	0	0	NR	0
Proposed NPL		1.000	0	0	0	0	NR	0
Delisted NPL		1.000	0	0	0	0	NR	0
NPL RECOVERY		TP	NR	NR	NR	NR	NR	0
CERCLIS	X	0.500	0	0	0	NR	NR	0
CERC-NFRAP		0.500	0	0	1	NR	NR	1
CORRACTS		1.000	0	0	0	0	NR	0
RCRA TSD		0.500	0	0	0	NR	NR	0
RCRA Lg. Quan. Gen.		0.250	0	0	NR	NR	NR	0
RCRA Sm. Quan. Gen.	X	0.250	2	11	NR	NR	NR	13
ERNS		TP	NR	NR	NR	NR	NR	0
HMIRS		TP	NR	NR	NR	NR	NR	0
US ENG CONTROLS		0.500	0	0	0	NR	NR	0
US INST CONTROL		0.500	0	0	0	NR	NR	0
DOD		1.000	0	0	0	0	NR	0
FUDS		1.000	0	0	0	0	NR	0
US BROWNFIELDS		0.500	0	0	0	NR	NR	0
CONSENT		1.000	0	0	0	0	NR	0
ROD		1.000	0	0	0	0	NR	0
UMTRA		0.500	0	0	0	NR	NR	0
ODI		0.500	0	0	0	NR	NR	0
TRIS		TP	NR	NR	NR	NR	NR	0
TSCA		TP	NR	NR	NR	NR	NR	0
FTTS		TP	NR	NR	NR	NR	NR	0
SSTS		TP	NR	NR	NR	NR	NR	0
ICIS		TP	NR	NR	NR	NR	NR	0
PADS		TP	NR	NR	NR	NR	NR	0
MLTS		TP	NR	NR	NR	NR	NR	0
MINES		0.250	0	0	NR	NR	NR	0
FINDS	X	TP	NR	NR	NR	NR	NR	0
RAATS		TP	NR	NR	NR	NR	NR	0
STATE AND LOCAL RECORDS								
State Haz. Waste		1.000	0	0	0	0	NR	0
BRRTS	X	TP	NR	NR	NR	NR	NR	0
WI ERP	X	0.500	1	2	9	NR	NR	12
State Landfill		0.500	0	0	0	NR	NR	0
WI WDS		0.500	0	0	1	NR	NR	1
LUST		0.500	2	6	18	NR	NR	26
UST		0.250	6	17	NR	NR	NR	23
LAST		0.500	1	0	0	NR	NR	1
AST		0.250	2	2	NR	NR	NR	4
MANIFEST		0.250	0	0	NR	NR	NR	0
WI Spills	X	TP	NR	NR	NR	NR	NR	0
AGSPILLS		TP	NR	NR	NR	NR	NR	0
CRS		TP	NR	NR	NR	NR	NR	0
AUL		0.500	2	2	12	NR	NR	16

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
VCP		0.500	0	0	2	NR	NR	2
DRYCLEANERS		0.250	0	0	NR	NR	NR	0
WI WRRSER	X	TP	NR	NR	NR	NR	NR	0
BEAP		0.500	0	0	0	NR	NR	0
BROWNFIELDS	X	0.500	0	0	1	NR	NR	1
AIRS		TP	NR	NR	NR	NR	NR	0
TIER 2		TP	NR	NR	NR	NR	NR	0
LEAD		TP	NR	NR	NR	NR	NR	0
SHWIMS	X	TP	NR	NR	NR	NR	NR	0
TRIBAL RECORDS								
INDIAN RESERV		1.000	0	0	0	0	NR	0
INDIAN LUST		0.500	0	0	0	NR	NR	0
INDIAN UST		0.250	0	0	NR	NR	NR	0
EDR PROPRIETARY RECORDS								
Manufactured Gas Plants	X	1.000	0	0	0	0	NR	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

APPENDIX B2

EDR REPORT EXCERPTS FOR SITES B6, B9 AND C12

(Continued) **1000180010**

Tank Market:	No
Federally Regulated:	Yes
Facility ID:	146559
Facility county code:	36
Site Municipality:	C
Municipality Name:	MANITOWOC
Fire Dept ID:	Manitowoc
Town Cust ID:	382987
Land Owner Type:	Private
Owner Name:	WISCONSIN FUEL & LIGHT CO
Owner Address:	402 N 10TH ST
Owner PO Box:	Not reported
Owner City,St,Zip:	MANITOWOC, WI 54220
Building Name:	WISCONSIN FUEL & LIGHT CO
Building Address:	402 N 10TH ST
Building City,St,Zip:	MANITOWOC 54220

B6 **WCL** **WI ERP** **S105164673**
SE **SW CORNER 11TH ST / BUFFALO ST** **AUL** **N/A**
< 1/8 **MANITOWOC, WI 0**
381 ft.
Site 1 of 3 in cluster B

Relative:
Higher

Actual:
601 ft.

WI ERP:

Site Id:	6638000
Detail Seq No:	176478
Activity Type:	ERP
Activity Name:	W C L - TURNTABLE FORMER ROUNDHOUSE
Activity Number:	0236176478
Activity Display Number:	02-36-176478
Activity Detail Address:	NONE
Region Name:	NORTHEAST
Faclity ID:	NONE
Start Date:	11/10/1997
End Date:	00/00/0000
Last Action:	07/27/2006
Status Cd:	CC
Status:	CONDITIONALLY CLOSED
Jurisdiction:	DNR-RR
Act Code:	330
Owner Name:	Not reported
Owner Addr:	Not reported
Owner City,St,Zip:	Not reported
Dept Of Commerce Number:	NONE
Comm Occurrence Id:	NONE
EPA Cerclis Id:	NONE
Risk Code:	N/A
Acres:	.5
Acres 100:	N
EPA NPL Site?:	No
Dept Of Commerce Tracking:	No
PECFA Funds Eligible ?:	No
Above Ground Storage Tank?:	No
Drycleaner?:	No
Co-contamination?:	No
Public Land Survey System Desc:	NE 1/4 of the NE 1/4 of Sec 30, T19N, R24E
Geo Located:	NE
DNR GIS Registry View Map Layers:	N

WCL (Continued) **S105164673**

GIS Area Point Flag:	P		
Action Date:	11/10/97	Action Code:	1
Action Name:	Notification		
Action Date:	11/21/97	Action Code:	2
Action Name:	RP Letter Sent		
Action Date:	04/27/04	Action Code:	99
Action Name:	Miscellaneous/3		
Action Date:	06/07/05	Action Code:	50
Action Name:	GIS Registry Required		
Action Date:	07/07/04	Action Code:	43
Action Name:	Status Report Received/4		
Action Date:	05/24/04	Action Code:	43
Action Name:	Status Report Received/3		
Action Date:	02/24/03	Action Code:	99
Action Name:	Miscellaneous/2		
Action Date:	10/19/04	Action Code:	43
Action Name:	Status Report Received/6		
Action Date:	09/27/04	Action Code:	43
Action Name:	Status Report Received/5		
Action Date:	06/02/03	Action Code:	37
Action Name:	SI Report Received (w/out Fee)		
Action Date:	06/19/03	Action Code:	30
Action Name:	Site Investigation Workplan Go Ahead (notice to proceed)		
Action Date:	03/10/03	Action Code:	43
Action Name:	Status Report Received/2		
Action Date:	05/29/02	Action Code:	99
Action Name:	Miscellaneous		
Action Date:	06/18/02	Action Code:	43
Action Name:	Status Report Received		
Action Date:	07/28/05	Action Code:	80
Action Name:	Closure Not Approved		
Action Date:	09/26/05	Action Code:	43
Action Name:	Status Report Received/7		
Action Date:	06/07/05	Action Code:	79
Action Name:	Closure Review Request Received with Fee		
Action Date:	06/07/05	Action Code:	710
Action Name:	Date Soil Registry Fee Paid		
Action Date:	06/07/05	Action Code:	700
Action Name:	Date Groundwater Registry Fee Received		
Action Date:	05/15/06	Action Code:	99
Action Name:	Miscellaneous/4		
Action Date:	10/18/99	Action Code:	35
Action Name:	Site Investigation Workplan Received (w/out Fee)		
Action Desc:	Date Fee received for Closed Remediation Groundwater Site RegistryDate Fee received for Closed Remediation Soil Site RegistryDate closure not approved letter is sent.Date of letter to RP notifying of legal responsibilities associated with the discovery of contamination.Date the DNR allows the RP to proceed without approval of the SIWP. Either written or by phone call.Date the DNR is notified of the discovery of the contamination.Date the DNR receives the Site Investigation Report. Provides information regarding activities performed to determine degree & extent of contamination and forming a basis for choosing the appropriate remedial action.Date the DNR receives the Site Investigation Workplan. States the objectives of the investigation to determine the degree and extent of contamination.Date the closure review request is received and a fee paid for DNR review.Date updates on progress are received. Can be 30, 60, 90 days or other interval.Miscellaneous action. Please see action comments.Upon completing final closure conditions, this case will be		

WCL (Continued) **S105164673**

placed on the GIS Registry with groundwater contamination exceeding the NR140 Enforcement Standard and/or soil contamination above the NR720 RCL.

Active Comment: STATUS UPDATE REQUESTEDTRC HIRED AS CONSULTANT, WILL CONTINUE INVESTIGATIONSTATUS UPDATED REC'D, SENT RFPS SEEKING NEW CONSULTANTWDNR REQUESTS STATUS UPDATESTATUS UPDATE RECEIVED VIA E-MAILTELEPHONE CONVERSATION WITH CONSULTANTSIR - CONSULTANT RECOMMENDS MORE OFF-SITE INVESTIGATIONWILL HAVE REPORT BY MID- MARCHWDNR REQUEST FOR STATUS UPDATE & CHANGE RPQUARTERLY SAMPLING CONDUCTED IN 5 WELLS-2 MORE WELLS INSTALLED VOC'SAWAITING DEED RESTRICTION RECORDINGCN WORKING ON FUNDING CONTINUED WORK FOR CLOSURE DETERMINATIONSTATUS UPDATE REQUESTED (TEL CALL)

Active Desc: Not reported
Incident Date: Not reported
Report Date: Not reported
Spill Source: Not reported
DNR Investigate: Not reported
Spill Cause: Not reported
Spill Comments: Not reported
Spill Action Code: Not reported
Spill Action Desc: Not reported
Spill Action Cmmnts: Not reported
Substance Desc: Metals
Amount Released: Not reported
Release Code: Not reported
Substance Desc: Polynuclear Aromatic Hydrocarbons
Amount Released: Not reported
Release Code: Not reported
Substance Desc: Volatile Organic Compounds
Amount Released: Not reported
Release Code: Not reported
Spill Comments: Not reported
Impact Number: 176481
Impact Code: 5
Impact Comments: Soil Contamination
Impact Potential: Not reported
Impact Number: 176480
Impact Code: 4
Impact Comments: Groundwater Contamination
Impact Potential: Not reported
Org. Flag: Y
Contact name: SOO LINE RAILROAD
Contact Address: Not reported
Contact Addr2: Not reported
Contact City,St,Zip: MINNEAPOLIS, MN 55440
Contact Country: UNITED STATES
Comany Address: MINNEAPOLIS, MN 55440
Role Desc: Responsible Party
Org. Flag: Y
Contact name: CANADIAN NATIONAL RAILWAY PROPERTIES INC
Contact Address: 17641 S ASHLAND AVE
Contact Addr2: Not reported
Contact City,St,Zip: HOMEWOOD, IL 604301345
Contact Country: UNITED STATES
Comany Address: HOMEWOOD, IL 60430
Role Desc: Responsible Party
Org. Flag: N
Contact name: ANNETTE WEISSBACH
Contact Address: 2984 SHAWANO AVE

WCL (Continued) **S105164673**

Contact Addr2: Not reported
Contact City,St,Zip: GREEN BAY, WI 543070448
Contact Country: UNITED STATES
Comany Address: GREEN BAY, WI 54307
Role Desc: Project Manager

AUL:

Facid:	NONE	Site Id:	6638000
Detail Seq No:	176478	Region Name:	NORTHEAST
Action Code:	50		
Action Comments:	Not reported		
Action Date:	06/07/2005		
Activity Type:	ERP	Activity Name:	W C L - TURNTABLE FORMER ROUNDHOUSE
Activity Number:	0236176478	Display Number:	02-36-176478
Act Code:	330	Act Name:	GIS Registry Required
Detail Address:	NONE		
Start Date:	11/10/1997	End Date:	00/00/0000
Last Action:	07/27/2006	Status Cd:	CC
Status:	CONDITIONALLY CLOSED	Jurisdiction:	DNR-RR
Risk Code:	N/A	EPA NPL Site?:	No
Acres:	N	Acres 100:	N
Drycleaner:	No	Geo Located:	NE

Owner Name: Not reported
Owner Addr: Not reported
Owner City,St,Zip: Not reported
Dept Of Commerce Number: NONE
Comm Occurrence Id: NONE
EPA Cerclis Id: NONE
Dept Of Commerce Tracking: No
PECFA Funds Eligible ?: No
Above Ground Storage Tank?: No
Co-contamination?: No
Public Land Survey System Desc: NE 1/4 of the NE 1/4 of Sec 30, T19N, R24E
DNR GIS Registry View Map Layers: N
GIS Area Point Flag: P

Action Date:	11/10/97	Action Code:	1
Action Name:	Notification		
Action Date:	11/21/97	Action Code:	2
Action Name:	RP Letter Sent		
Action Date:	04/27/04	Action Code:	99
Action Name:	Miscellaneous/3		
Action Date:	06/07/05	Action Code:	50
Action Name:	GIS Registry Required		
Action Date:	07/07/04	Action Code:	43
Action Name:	Status Report Received/4		
Action Date:	05/24/04	Action Code:	43
Action Name:	Status Report Received/3		
Action Date:	02/24/03	Action Code:	99
Action Name:	Miscellaneous/2		
Action Date:	10/19/04	Action Code:	43
Action Name:	Status Report Received/6		
Action Date:	09/27/04	Action Code:	43
Action Name:	Status Report Received/5		
Action Date:	06/02/03	Action Code:	37
Action Name:	SI Report Received (w/out Fee)		
Action Date:	06/19/03	Action Code:	30
Action Name:	Site Investigation Workplan Go Ahead (notice to proceed)		
Action Date:	03/10/03	Action Code:	43

WCL (Continued) **S105164673**

Action Name:	Status Report Received/2		
Action Date:	05/29/02	Action Code:	99
Action Name:	Miscellaneous		
Action Date:	06/18/02	Action Code:	43
Action Name:	Status Report Received		
Action Date:	07/28/05	Action Code:	80
Action Name:	Closure Not Approved		
Action Date:	09/26/05	Action Code:	43
Action Name:	Status Report Received/7		
Action Date:	06/07/05	Action Code:	79
Action Name:	Closure Review Request Received with Fee		
Action Date:	06/07/05	Action Code:	710
Action Name:	Date Soil Registry Fee Paid		
Action Date:	06/07/05	Action Code:	700
Action Name:	Date Groundwater Registry Fee Received		
Action Date:	05/15/06	Action Code:	99
Action Name:	Miscellaneous/4		
Action Date:	10/18/99	Action Code:	35
Action Name:	Site Investigation Workplan Received (w/out Fee)		

Action Desc: Date Fee received for Closed Remediation Groundwater Site RegistryDate Fee received for Closed Remediation Soil Site RegistryDate closure not approved letter is sent.Date of letter to RP notifying of legal responsibilities associated with the discovery of contamination.Date the DNR allows the RP to proceed without approval of the SIWP. Either written or by phone call.Date the DNR is notified of the discovery of the contamination.Date the DNR receives the Site Investigation Report. Provides information regarding activities performed to determine degree & extent of contamination and forming a basis for choosing the appropriate remedial action.Date the DNR receives the Site Investigation Workplan. States the objectives of the investigation to determine the degree and extent of contamination.Date the closure review request is received and a fee paid for DNR review.Date updates on progress are received. Can be 30, 60, 90 days or other interval.Miscellaneous action. Please see action comments.Upon completing final closure conditions, this case will be placed on the GIS Registry with groundwater contamination exceeding the NR140 Enforcement Standard and/or soil contamination above the NR720 RCL.

Active Comment: STATUS UPDATE REQUESTEDTRC HIRED AS CONSULTANT, WILL CONTINUE INVESTIGATIONSTATUS UPDATED REC'D, SENT RFPS SEEKING NEW CONSULTANTWDNR REQUESTS STATUS UPDATESTATUS UPDATE RECEIVED VIA E-MAILTELEPHONE CONVERSATION WITH CONSULTANTSIR - CONSULTANT RECOMMENDS MORE OFF-SITE INVESTIGATIONWILL HAVE REPORT BY MID- MARCHWDNR REQUEST FOR STATUS UPDATE & CHANGE RPQUARTERLY SAMPLING CONDUCTED IN 5 WELLS-2 MORE WELLS INSTALLED VOC'SAWAITING DEED RESTRICTION RECORDINGCN WORKING ON FUNDING CONTINUED WORK FOR CLOSURE DETERMINATIONSTATUS UPDATE REQUESTED (TEL CALL)

Active Desc: Not reported

Incident Date:	Not reported
Report Date:	Not reported
Spill Source:	Not reported
DNR Investigate:	Not reported
Spill Cause:	Not reported
Spill Comments:	Not reported
Spill Action Code:	Not reported
Spill Action Desc:	Not reported
Spill Action Cmmnts:	Not reported
Substance Desc:	Metals
Amount Released:	Not reported
Release Code:	Not reported
Substance Desc:	Polynuclear Aromatic Hydrocarbons

WCL (Continued) **S105164673**

Amount Released:	Not reported
Release Code:	Not reported
Substance Desc:	Volatile Organic Compounds
Amount Released:	Not reported
Release Code:	Not reported
Spill Comments:	Not reported
Impact Number:	176481
Impact Code:	5
Impact Comments:	Soil Contamination
Impact Potential:	Not reported
Impact Number:	176480
Impact Code:	4
Impact Comments:	Groundwater Contamination
Impact Potential:	Not reported
Org. Flag:	Y
Contact name:	SOO LINE RAILROAD
Contact Address:	Not reported
Contact Addr2:	Not reported
Contact City,St,Zip:	MINNEAPOLIS, MN 55440
Contact Country:	UNITED STATES
Comany Address:	MINNEAPOLIS, MN 55440
Role Desc:	Responsible Party
Org. Flag:	Y
Contact name:	CANADIAN NATIONAL RAILWAY PROPERTIES INC
Contact Address:	17641 S ASHLAND AVE
Contact Addr2:	Not reported
Contact City,St,Zip:	HOMEWOOD, IL 604301345
Contact Country:	UNITED STATES
Comany Address:	HOMEWOOD, IL 60430
Role Desc:	Responsible Party
Org. Flag:	N
Contact name:	ANNETTE WEISSBACH
Contact Address:	2984 SHAWANO AVE
Contact Addr2:	Not reported
Contact City,St,Zip:	GREEN BAY, WI 543070448
Contact Country:	UNITED STATES
Comany Address:	GREEN BAY, WI 54307
Role Desc:	Project Manager

7
ESE
< 1/8
404 ft.

950 CHICAGO ST
MANITOWOC, WI 54220

UST **U002140612**
N/A

Relative:
Higher

Actual:
605 ft.

UST:

Object ID:	414821
Object Type:	UST
Tank Wang Object ID:	360700556
Tank Status:	**Abandoned without Product**
Wall Size:	Single
Tank Status Date:	Not reported
Tank Size (gal):	800
Tank Contents:	Waste/Used Motor Oil
Tank Occupancy:	Mercantile/Commercial
Tank Market:	No
Federally Regulated:	Yes
Facility ID:	64335
Facility county code:	36

(Continued) **U002149254**

Land Owner Type: Private
Owner Name: RODNEY PAJULA
Owner Address: 315 N 10TH ST
Owner PO Box: Not reported
Owner City,St,Zip: MANITOWOC, WI 54220
Building Name: REDS UNION 76
Building Address: 315 N 10TH ST
Building City,St,Zip: MANITOWOC 54220

B9 **JAEGER BAKERY** **RCRA-SQG** **1000879438**
SSE **308 N 10TH ST** **FINDS** **WI0000072157**
< 1/8 **MANITOWOC, WI 54220** **LUST**
431 ft. **SHWIMS**

Site 3 of 3 in cluster B

Relative:
Higher

Actual:
600 ft.

RCRAInfo:
Owner: METZ BAKING CO
EPA ID: WI0000072157

Contact: CHRISTOPHER RANTS

Classification: Small Quantity Generator
TSDF Activities: Not reported

Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

LUST:
Site Id: 2734100
Detail Seq No: 26076
Activity Type: LUST
Activity Name: JAEGER BAKERY
Activity Number: 0336001210
Activity Display Number: 03-36-001210
Activity Detail Address: NONE
Region Name: NORTHEAST
Faclity ID: 436104460
Start Date: 06/22/1992
End Date: 08/30/1996
Last Action: 08/30/1996
Status Cd: C
Status: **CLOSED**
Jurisdiction: DNR-RR
Act Code: 340
Owner Name: METZ BAKING CO
Owner Addr: 1014 NEBRASKA ST
Owner City,St,Zip: SOUIX CITY, IA 51005

JAEGER BAKERY (Continued) **1000879438**

Dept Of Commerce Number:	54220401806		
Comm Occurrence Id:	8446		
EPA Cerclis Id:	NONE		
Risk Code:	HIGH		
Acres:	UNKNOWN		
Acres 100:	N		
EPA NPL Site?:	No		
Dept Of Commerce Tracking:	Yes		
PECFA Funds Eligible ?:	Yes		
Above Ground Storage Tank?:	No		
Drycleaner?:	No		
Co-contamination?:	No		
Public Land Survey System Desc:	NE 1/4 of the NE 1/4 of Sec 30, T19N, R24E		
Geo Located:	NE		
DNR GIS Registry View Map Layers:	N		
GIS Area Point Flag:	P		
Action Date:	07/06/94	Action Code:	3
Action Name:	Notice of Noncompliance (NON)/2		
Action Date:	01/09/95	Action Code:	37
Action Name:	SI Report Received (w/out Fee)		
Action Date:	06/06/92	Action Code:	2
Action Name:	RP Letter Sent		
Action Date:	12/05/94	Action Code:	43
Action Name:	Status Report Received/2		
Action Date:	06/28/95	Action Code:	43
Action Name:	Status Report Received/5		
Action Date:	01/17/95	Action Code:	30
Action Name:	Site Investigation Workplan Go Ahead (notice to proceed)		
Action Date:	08/30/96	Action Code:	11
Action Name:	Activity Closed		
Action Date:	01/09/95	Action Code:	59
Action Name:	Enforcement End/Return to Compliance		
Action Date:	11/15/94	Action Code:	14
Action Name:	Notice of Violation (NOV)		
Action Date:	04/28/95	Action Code:	43
Action Name:	Status Report Received/4		
Action Date:	07/19/96	Action Code:	43
Action Name:	Status Report Received/6		
Action Date:	06/22/92	Action Code:	1
Action Name:	Notification		
Action Date:	04/26/96	Action Code:	37
Action Name:	SI Report Received (w/out Fee)/2		
Action Date:	07/06/92	Action Code:	2
Action Name:	RP Letter Sent/2		
Action Date:	06/02/93	Action Code:	3
Action Name:	Notice of Noncompliance (NON)		
Action Date:	01/13/95	Action Code:	43
Action Name:	Status Report Received/3		
Action Date:	11/30/94	Action Code:	43
Action Name:	Status Report Received		
Action Date:	04/26/96	Action Code:	39
Action Name:	Remedial Action Options Report received (w/out Fee)		
Action Desc:	Date RP is sent a Notice of Noncompliance (NON) as a result of their failure or refusal to comply. Identifies the specific violation and requires a response within a given time period.Date of letter to RP notifying of legal responsibilities associated with the discovery of contamination.Date the Closure Letter or No Further Action letter is sent. NOTE: This is the ONLY		

JAEGER BAKERY (Continued) **1000879438**

action code that will close an activity.Date the DNR allows the RP to proceed without approval of the SIWP. Either written or by phone call.Date the DNR is notified of the discovery of the contamination.Date the DNR receives the Remedial Action Options Report (workplan). Includes actions to prevent, minimize, stabilize, eliminate threat of discharged hazardous substances, restore the environment to the extent practicable. Identify and evaluate opDate the DNR receives the Site Investigation Report. Provides information regarding activities performed to determine degree & extent of contamination and forming a basis for choosing the appropriate remedial action.Date the DNR sends letter indicating no further enforcement action will be taken at this time.Date the RP is sent a Notice of Violation (NOV) stating that a violation exists & the violator is responsible. Advises of possible prosecution & forfeitures. Requires written response within a specified time. More specific than NON.Date updates on progress are received. Can be 30, 60, 90 days or other interval.tions consistent with DNR standards.

Active Comment: SI WORKPLAN DUE 10/6/92LAB RESULTSRI UPDATEQUARTERLY REPORT; GW RESULTSSI WORKPLAN DUE 8/5/93ENF. CONF. CANCELLEDMORE INFO HAD TO BE REQUESTED
Active Desc: Not reported
Incident Date: Not reported
Report Date: Not reported
Spill Source: Not reported
DNR Investigate: Not reported
Spill Cause: Not reported
Spill Comments: Not reported
Spill Action Code: Not reported
Spill Action Desc: Not reported
Spill Action Cmmnts: Not reported
Substance Desc: Not reported
Amount Released: Not reported
Release Code: Not reported
Spill Comments: Not reported
Impact Number: 69273
Impact Code: 5
Impact Comments: Soil Contamination
Impact Potential: Not reported
Impact Number: 99944
Impact Code: 4
Impact Comments: Groundwater Contamination
Impact Potential: Not reported
Org. Flag: Y
Contact name: METZ BAKING CO
Contact Address: Not reported
Contact Addr2: Not reported
Contact City,St,Zip: SIOUX CITY, IA 51102
Contact Country: UNITED STATES
Comany Address: SIOUX CITY, IA 51102
Role Desc: Responsible Party
Org. Flag: N
Contact name: KELD LAURIDSEN
Contact Address: 2984 SHAWANO AVE
Contact Addr2: Not reported
Contact City,St,Zip: GREEN BAY, WI 543070448
Contact Country: UNITED STATES
Comany Address: GREEN BAY, WI 54307
Role Desc: Project Manager

Intentionally

Left

Blank

(Continued) **U002205204**

Object ID:	415121
Object Type:	UST
Tank Wang Object ID:	360700933
Tank Status:	**Closed/Removed**
Wall Size:	Single
Tank Status Date:	1996-07-15 00:00:00.0
Tank Size (gal):	1500
Tank Contents:	Unleaded Gasoline
Tank Occupancy:	Bulk Storage
Tank Market:	Yes
Federally Regulated:	Yes
Facility ID:	72466
Facility county code:	36
Site Municipality:	C
Municipality Name:	MANITOWOC
Fire Dept ID:	Manitowoc
Town Cust ID:	389736
Land Owner Type:	Private
Owner Name:	HOLMES OIL CO
Owner Address:	702 PARK
Owner PO Box:	Not reported
Owner City,St,Zip:	MANITOWOC, WI 54220
Building Name:	HOLMES OIL CO
Building Address:	1110 BUFFALO ST
Building City,St,Zip:	MANITOWOC 54220

C12 **HOLMES OIL CORP** **LUST** **S102322070**
SSW **1110 BUFFALO ST** **LAST** **N/A**
< 1/8 **MANITOWOC, WI 54220** **CRS**
464 ft. **AUL**
Site 2 of 6 in cluster C **SHWIMS**

Relative:
Lower

Actual:
593 ft.

LUST:

Site Id:	3858800
Detail Seq No:	28607
Activity Type:	LUST
Activity Name:	HOLMES OIL CORP
Activity Number:	0336001962
Activity Display Number:	03-36-001962
Activity Detail Address:	NONE
Region Name:	NORTHEAST
Faclity ID:	NONE
Start Date:	11/11/1994
End Date:	10/17/2005
Last Action:	11/18/2005
Status Cd:	C
Status:	**CLOSED**
Jurisdiction:	COMMERCE
Act Code:	340
Owner Name:	WILLIAM HOLMES
Owner Addr:	702 PARK ST
Owner City,St,Zip:	MANITOWOC, WI 54220
Dept Of Commerce Number:	54220462114
Comm Occurrence Id:	12848
EPA Cerclis Id:	NONE
Risk Code:	MEDIUM
Acres:	UNKNOWN
Acres 100:	N

HOLMES OIL CORP (Continued) **S102322070**

EPA NPL Site?:	No
Dept Of Commerce Tracking:	Yes
PECFA Funds Eligible ?:	Yes
Above Ground Storage Tank?:	Yes
Drycleaner?:	No
Co-contamination?:	No
Public Land Survey System Desc:	NE 1/4 of the NE 1/4 of Sec 30, T19N, R24E
Geo Located:	NE
DNR GIS Registry View Map Layers:	N
GIS Area Point Flag:	P

Action Date:	05/30/95	Action Code:	35
Action Name:	Site Investigation Workplan Received (w/out Fee)		
Action Date:	11/16/94	Action Code:	2
Action Name:	RP Letter Sent		
Action Date:	04/19/99	Action Code:	43
Action Name:	Status Report Received		
Action Date:	10/17/05	Action Code:	11
Action Name:	Activity Closed		
Action Date:	09/15/05	Action Code:	84
Action Name:	Conditional Closure		
Action Date:	05/19/98	Action Code:	37
Action Name:	SI Report Received (w/out Fee)		
Action Date:	08/22/05	Action Code:	710
Action Name:	Date Soil Registry Fee Paid		
Action Date:	08/22/05	Action Code:	700
Action Name:	Date Groundwater Registry Fee Received		
Action Date:	12/03/99	Action Code:	76
Action Name:	Activity Transferred to Dept. of Commerce		
Action Date:	08/22/05	Action Code:	50
Action Name:	GIS Registry Required		
Action Date:	11/18/05	Action Code:	100
Action Name:	GIS Registry QAQC Completed		
Action Date:	06/05/95	Action Code:	30
Action Name:	Site Investigation Workplan Go Ahead (notice to proceed)		
Action Date:	11/11/94	Action Code:	1
Action Name:	Notification		

Action Desc: Date Fee received for Closed Remediation Groundwater Site RegistryDate Fee received for Closed Remediation Soil Site RegistryDate and status that this site had QAQC completed for GIS registryDate of letter to RP notifying of legal responsibilities associated with the discovery of contamination.Date the Closure Letter or No Further Action letter is sent. NOTE: This is the ONLY action code that will close an activity.Date the DNR allows the RP to proceed without approval of the SIWP. Either written or by phone call.Date the DNR is notified of the discovery of the contamination.Date the DNR receives the Site Investigation Report. Provides information regarding activities performed to determine degree & extent of contamination and forming a basis for choosing the appropriate remedial action.Date the DNR receives the Site Investigation Workplan. States the objectives of the investigation to determine the degree and extent of contamination.Date the site closure was approved, but the site will not be formally closed until receipt of documentation of abandonment of wells, disposal of soil, recording of deed instruments , etc.Date updates on progress are received. Can be 30, 60, 90 days or other interval.Oversight of medium or low risk petroleum cleanup has been transferred to the Wisconsin Department of Commerce.Upon completing final closure conditions, this case will be placed on the GIS Registry with groundwater contamination exceeding the NR140 Enforcement Standard and/or soil contamination above the NR720 RCL.

Active Comment: SIWP DUE 1/20/95*** NR726 Closure from Commerce Data Interchange ******

HOLMES OIL CORP (Continued) **S102322070**

Conditional Closure from Commerce Data Interchange ****** SIR Received by Commerce - Updated from Commerce Data Interchange ***NOT HIGH RISK; CLOSURE REQUEST RECEIVEDAUTOPOPULATED FROM 700/710 ACTION ENTRY ON 20-OCT-05

Active Desc: Not reported
Incident Date: Not reported
Report Date: Not reported
Spill Source: Not reported
DNR Investigate: Not reported
Spill Cause: Not reported
Spill Comments: Not reported
Spill Action Code: Not reported
Spill Action Desc: Not reported
Spill Action Cmmnts: Not reported
Substance Desc: Not reported
Amount Released: Not reported
Release Code: Not reported
Spill Comments: Not reported
Impact Number: 72031
Impact Code: 5
Impact Comments: Soil Contamination
Impact Potential: Not reported
Impact Number: 187676
Impact Code: 4
Impact Comments: Groundwater Contamination
Impact Potential: Not reported
Org. Flag: Y
Contact name: WISCONSIN CENTRAL LTD
Contact Address: Not reported
Contact Addr2: Not reported
Contact City,St,Zip: ROSEMONT, IL 600175062
Contact Country: UNITED STATES
Comany Address: ROSEMONT, IL 60017
Role Desc: Responsible Party
Org. Flag: Y
Contact name: WI DEPT OF COMMERCE (DCOM)
Contact Address: 201 WEST WASHINGTON AVE
Contact Addr2: Not reported
Contact City,St,Zip: MADISON, WI 53703
Contact Country: UNITED STATES
Comany Address: MADISON, WI 53703
Role Desc: Project Manager

LAST:
Jurisdiction: COMMERCE
Region: NORTHEAST
Facility ID: NONE
Site ID: 3858800
Seq No: 28607
AST Flag: Yes
Start Date: 11/11/1994
End Date: 10/17/2005
Last Action: 11/18/2005
Activity Type: LUST
Action Date: 05/30/95 Action Code: 35
Action Name: Site Investigation Workplan Received (w/out Fee)
Action Date: 11/16/94 Action Code: 2
Action Name: RP Letter Sent
Action Date: 04/19/99 Action Code: 43

HOLMES OIL CORP (Continued) **S102322070**

Action Name:	Status Report Received		
Action Date:	10/17/05	Action Code:	11
Action Name:	Activity Closed		
Action Date:	09/15/05	Action Code:	84
Action Name:	Conditional Closure		
Action Date:	05/19/98	Action Code:	37
Action Name:	SI Report Received (w/out Fee)		
Action Date:	08/22/05	Action Code:	710
Action Name:	Date Soil Registry Fee Paid		
Action Date:	08/22/05	Action Code:	700
Action Name:	Date Groundwater Registry Fee Received		
Action Date:	12/03/99	Action Code:	76
Action Name:	Activity Transferred to Dept. of Commerce		
Action Date:	08/22/05	Action Code:	50
Action Name:	GIS Registry Required		
Action Date:	11/18/05	Action Code:	100
Action Name:	GIS Registry QAQC Completed		
Action Date:	06/05/95	Action Code:	30
Action Name:	Site Investigation Workplan Go Ahead (notice to proceed)		
Action Date:	11/11/94	Action Code:	1
Action Name:	Notification		

Action Desc: Date Fee received for Closed Remediation Groundwater Site RegistryDate Fee received for Closed Remediation Soil Site RegistryDate and status that this site had QAQC completed for GIS registryDate of letter to RP notifying of legal responsibilities associated with the discovery of contamination.Date the Closure Letter or No Further Action letter is sent. NOTE: This is the ONLY action code that will close an activity.Date the DNR allows the RP to proceed without approval of the SIWP. Either written or by phone call.Date the DNR is notified of the discovery of the contamination.Date the DNR receives the Site Investigation Report. Provides information regarding activities performed to determine degree & extent of contamination and forming a basis for choosing the appropriate remedial action.Date the DNR receives the Site Investigation Workplan. States the objectives of the investigation to determine the degree and extent of contamination.Date the site closure was approved, but the site will not be formally closed until receipt of documentation of abandonment of wells, disposal of soil, recording of deed instruments , etc.Date updates on progress are received. Can be 30, 60, 90 days or other interval.Oversight of medium or low risk petroleum cleanup has been transferred to the Wisconsin Department of Commerce.Upon completing final closure conditions, this case will be placed on the GIS Registry with groundwater contamination exceeding the NR140 Enforcement Standard and/or soil contamination above the NR720 RCL.

Active Comment: SIWP DUE 1/20/95*** NR726 Closure from Commerce Data Interchange ****** Conditional Closure from Commerce Data Interchange ****** SIR Received by Commerce - Updated from Commerce Data Interchange ***NOT HIGH RISK; CLOSURE REQUEST RECEIVEDAUTOPOPULATED FROM 700/710 ACTION ENTRY ON 20-OCT-05

Active Desc: Not reported

Incident Date:	Not reported
Report Date:	Not reported
Spill Source:	Not reported
DNR Investigate:	Not reported
Spill Cause:	Not reported
Spill Comments:	Not reported
Spill Action Code:	Not reported
Spill Action Desc:	Not reported
Spill Action Cmmnts:	Not reported
Substance Desc:	Not reported
Amount Released:	Not reported

HOLMES OIL CORP (Continued) **S102322070**

Release Code:	Not reported
Spill Comments:	Not reported
Impact Number:	72031
Impact Code:	5
Impact Comments:	Soil Contamination
Impact Potential:	Not reported
Impact Number:	187676
Impact Code:	4
Impact Comments:	Groundwater Contamination
Impact Potential:	Not reported
Org. Flag:	Y
Contact name:	WISCONSIN CENTRAL LTD
Contact Address:	Not reported
Contact Addr2:	Not reported
Contact City,St,Zip:	ROSEMONT, IL 600175062
Contact Country:	UNITED STATES
Comany Address:	ROSEMONT, IL 60017
Role Desc:	Responsible Party
Org. Flag:	Y
Contact name:	WI DEPT OF COMMERCE (DCOM)
Contact Address:	201 WEST WASHINGTON AVE
Contact Addr2:	Not reported
Contact City,St,Zip:	MADISON, WI 53703
Contact Country:	UNITED STATES
Comany Address:	MADISON, WI 53703
Role Desc:	Project Manager

CRS:

Object ID:	20903539
DNR Activity Number:	0336001962
Site ID:	3858800
Facility ID:	Not reported
Activity Detail Name:	HOLMES OIL CORP
Start Date:	11/11/94
End Date:	10/17/05
Soil or Groundwater:	Groundwater and Soil

AUL:

Facid:	NONE	Site Id:	3858800
Detail Seq No:	28607	Region Name:	NORTHEAST
Action Code:	50		

Action Comments:AUTOPOPULATED FROM 700/710 ACTION ENTRY ON 20-OCT-05

Action Date:	08/22/2005		
Activity Type:	LUST	Activity Name:	HOLMES OIL CORP
Activity Number:	0336001962	Display Number:	03-36-001962
Act Code:	340	Act Name:	GIS Registry Required
Detail Address:	NONE		
Start Date:	11/11/1994	End Date:	10/17/2005
Last Action:	11/18/2005	Status Cd:	C
Status:	CLOSED	Jurisdiction:	COMMERCE
Risk Code:	MEDIUM	EPA NPL Site?:	No
Acres:	N	Acres 100:	N
Drycleaner:	No	Geo Located:	NE

Owner Name:	WILLIAM HOLMES
Owner Addr:	702 PARK ST
Owner City,St,Zip:	MANITOWOC, WI 54220

HOLMES OIL CORP (Continued) **S102322070**

Dept Of Commerce Number:	54220462114		
Comm Occurrence Id:	12848		
EPA Cerclis Id:	NONE		
Dept Of Commerce Tracking:	Yes		
PECFA Funds Eligible ?:	Yes		
Above Ground Storage Tank?:	Yes		
Co-contamination?:	No		
Public Land Survey System Desc:	NE 1/4 of the NE 1/4 of Sec 30, T19N, R24E		
DNR GIS Registry View Map Layers:	N		
GIS Area Point Flag:	P		
Action Date:	05/30/95	Action Code:	35
Action Name:	Site Investigation Workplan Received (w/out Fee)		
Action Date:	11/16/94	Action Code:	2
Action Name:	RP Letter Sent		
Action Date:	04/19/99	Action Code:	43
Action Name:	Status Report Received		
Action Date:	10/17/05	Action Code:	11
Action Name:	Activity Closed		
Action Date:	09/15/05	Action Code:	84
Action Name:	Conditional Closure		
Action Date:	05/19/98	Action Code:	37
Action Name:	SI Report Received (w/out Fee)		
Action Date:	08/22/05	Action Code:	710
Action Name:	Date Soil Registry Fee Paid		
Action Date:	08/22/05	Action Code:	700
Action Name:	Date Groundwater Registry Fee Received		
Action Date:	12/03/99	Action Code:	76
Action Name:	Activity Transferred to Dept. of Commerce		
Action Date:	08/22/05	Action Code:	50
Action Name:	GIS Registry Required		
Action Date:	11/18/05	Action Code:	100
Action Name:	GIS Registry QAQC Completed		
Action Date:	06/05/95	Action Code:	30
Action Name:	Site Investigation Workplan Go Ahead (notice to proceed)		
Action Date:	11/11/94	Action Code:	1
Action Name:	Notification		
Action Desc:	Date Fee received for Closed Remediation Groundwater Site RegistryDate Fee received for Closed Remediation Soil Site RegistryDate and status that this site had QAQC completed for GIS registryDate of letter to RP notifying of legal responsibilities associated with the discovery of contamination.Date the Closure Letter or No Further Action letter is sent. NOTE: This is the ONLY action code that will close an activity.Date the DNR allows the RP to proceed without approval of the SIWP. Either written or by phone call.Date the DNR is notified of the discovery of the contamination.Date the DNR receives the Site Investigation Report. Provides information regarding activities performed to determine degree & extent of contamination and forming a basis for choosing the appropriate remedial action.Date the DNR receives the Site Investigation Workplan. States the objectives of the investigation to determine the degree and extent of contamination.Date the site closure was approved, but the site will not be formally closed until receipt of documentation of abandonment of wells, disposal of soil, recording of deed instruments , etc.Date updates on progress are received. Can be 30, 60, 90 days or other interval.Oversight of medium or low risk petroleum cleanup has been transferred to the Wisconsin Department of Commerce.Upon completing final closure conditions, this case will be placed on the GIS Registry with groundwater contamination exceeding the NR140 Enforcement Standard and/or soil contamination above the NR720 RCL.		
Active Comment:	SIWP DUE 1/20/95*** NR726 Closure from Commerce Data Interchange ******		

HOLMES OIL CORP (Continued) **S102322070**

Conditional Closure from Commerce Data Interchange ****** SIR Received by Commerce - Updated from Commerce Data Interchange ***NOT HIGH RISK; CLOSURE REQUEST RECEIVEDAUTOPOPULATED FROM 700/710 ACTION ENTRY ON 20-OCT-05

Active Desc:	Not reported
Incident Date:	Not reported
Report Date:	Not reported
Spill Source:	Not reported
DNR Investigate:	Not reported
Spill Cause:	Not reported
Spill Comments:	Not reported
Spill Action Code:	Not reported
Spill Action Desc:	Not reported
Spill Action Cmmnts:	Not reported
Substance Desc:	Not reported
Amount Released:	Not reported
Release Code:	Not reported
Spill Comments:	Not reported
Impact Number:	72031
Impact Code:	5
Impact Comments:	Soil Contamination
Impact Potential:	Not reported
Impact Number:	187676
Impact Code:	4
Impact Comments:	Groundwater Contamination
Impact Potential:	Not reported
Org. Flag:	Y
Contact name:	WISCONSIN CENTRAL LTD
Contact Address:	Not reported
Contact Addr2:	Not reported
Contact City,St,Zip:	ROSEMONT, IL 600175062
Contact Country:	UNITED STATES
Comany Address:	ROSEMONT, IL 60017
Role Desc:	Responsible Party
Org. Flag:	Y
Contact name:	WI DEPT OF COMMERCE (DCOM)
Contact Address:	201 WEST WASHINGTON AVE
Contact Addr2:	Not reported
Contact City,St,Zip:	MADISON, WI 53703
Contact Country:	UNITED STATES
Comany Address:	MADISON, WI 53703
Role Desc:	Project Manager

C13
SSW
< 1/8
464 ft.

Relative:
Lower

Actual:
593 ft.

HOLMES OIL
1110 BUFFALO ST
MANITOWOC, WI 54220

Site 3 of 6 in cluster C

RCRA-SQG **1004799834**
FINDS **WIR000016501**

APPENDIX B3

FORMER HOLMES OIL INFORMATION FROM WDNR BRRTS AND GIS REGISTRY SITES

WDNR BRRTS on the Web

HOLMES OIL CORP
Remediation Activity Details

PRINT | HELP | FEEDBACK

Activity Number and Name	Activity Type	Status
03-36-001962 HOLMES OIL CORP	**LUST**	CLOSED

Facility ID	Start Date	Location Name View other activities at this Location
NONE	11/11/1994	**HOLMES OIL CORP**

Commerce Number	End Date	Address View on Google Maps™ [Exit DNR]	Municipality
54220462114 [Exit DNR]	10/17/2005	1110 BUFFALO ST	MANITOWOC

EPA CERCLIS ID	Date of Last Action	County	DNR Region
NONE	11/18/2005	MANITOWOC	NORTHEAST

Agency Jurisdiction	Petroleum Risk	Other Location Info	Plot Size (Acres)
COMMERCE	MEDIUM	NONE	UNKNOWN

Public Land Survey System Description	DNR RR Sites Map
NE 1/4 of the NE 1/4 of Sec 30, T19N, R24E	View Activity on Map

Comments

**** TRANSFERRED TO COMMERCE - ACTIVITY NO LONGER UNDER DNR JURISDICTION *** THERE ARE 0 REMEDIATION AND NO WASTE ACTIVITIES AT THIS LOCATION. CLICK ON THE LOCATION NAME LINK TO VIEW LOCATION DETAILS AND VIEW OTHER ACTIVITIES AT THIS LOCATION.*

Characteristics

EPA NPL Site?	Commerce Tracked?	Eligible for PECFA Funds?	Above Ground Storage Tank?	Drycleaner?	Co-Contamination?
No	**Yes**	**Yes**	**Yes**	**No**	**No**

Actions

Place Cursor Over Code to View Description

Date	Code	Name	Comment
11/11/1994	**1**	Notification	-
11/16/1994	**2**	RP Letter Sent	SIWP DUE 1/20/95
05/30/1995	**35**	Site Investigation Workplan Received (w/out Fee)	-
06/05/1995	**30**	Site Investigation Workplan Go Ahead (notice to proceed)	-
05/19/1998	**37**	SI Report Received (w/out Fee)	*** SIR Received by Commerce - Updated from Commerce Data Interchange ***
04/19/1999	**43**	Status Report Received	-
12/03/1999	**76**	Activity Transferred to Dept. of Commerce	NOT HIGH RISK; CLOSURE REQUEST RECEIVED
08/22/2005	**50**	GIS Registry Site	AUTOPOPULATED FROM 700/710 ACTION ENTRY ON 20-OCT-05
08/22/2005	**700**	Date Groundwater Registry Fee Received	-

08/22/2005	710	Date Soil Registry Fee Paid	-
09/15/2005	84	Conditional Closure	*** Conditional Closure from Commerce Data Interchange ***
10/17/2005	11	Activity Closed	*** NR726 Closure from Commerce Data Interchange ***
11/18/2005	100	GIS Registry QAQC Completed	-

Impacts	
Type	Comment
Groundwater Contamination	-
Soil Contamination	-

Who
Project Manager: **WI DEPT OF COMMERCE (DCOM)** 201 WEST WASHINGTON AVE MADISON, WI 53703

BRRTS data comes from various sources, both internal and external to DNR. There may be omissions and errors in the data and delays in updating new information. Please see the BOTW disclaimers page for more information.

GIS REGISTRY INFORMATION

SITE NAME:	Holmes Oil Corp		
BRRTS #:	03-36-001962	FID # (if appropriate):	
COMMERCE # (if appropriate):	54220-4621-14		
CLOSURE DATE:	10/17/05		
STREET ADDRESS:	1114 Buffalo St		
CITY:	Manitowoc		

SOURCE PROPERTY GPS COORDINATES (meters in WTM91 projection):	X =	707083		Y =	405089	
CONTAMINATED MEDIA:	Groundwater		Soil		Both	x
OFF-SOURCE GW CONTAMINATION >ES:		Yes			No	x
• **IF YES, STREET ADDRESS:**						
• **GPS COORDINATES** (meters in WTM91 projection):	X =			Y =		
OFF-SOURCE SOIL CONTAMINATION >Generic or Site-Specific RCL (SSRCL):	Yes			No	x	
• **IF YES, STREET ADDRESS 1:**						
• **GPS COORDINATES** (meters in WTM91 projection):	X =			Y =		
CONTAMINATION IN RIGHT OF WAY:	Yes			No	x	

DOCUMENTS NEEDED

Closure Letter, and any conditional closure letter issued	x
Copy of most recent deed, including legal description, for all affected properties	x
Certified survey map or relevant portion of the recorded plat map (*If referenced in the legal description*) **for all affected properties**	x
County Parcel ID number, ***if used for county,*** **for all affected properties (See map)**	x
Location Map which outlines all properties within contaminated site boundaries on USGS topographic map or plat map in sufficient detail to permit the parcels to be located easily (8.5x14" if paper copy). If groundwater standards are exceeded, the map must also include the location of all municipal and potable wells within 1200' of the site.	x
Detailed Site Map(s) for all affected properties, showing buildings, roads, property boundaries, contaminant sources, utility lines, monitoring wells and potable wells. (8.5x14", if paper copy) This map shall also show the location of all contaminated public streets, highway and railroad rights-of-way in relation to the source property and in relation to the boundaries of groundwater contamination exceeding ch. NR 140 ESs and soil contamination exceeding ch. NR 720 generic or SSRCLs.	x
Tables of Latest Groundwater Analytical Results (no shading or cross-hatching)	x
Tables of Latest Soil Analytical Results (no shading or cross-hatching)	x
Isoconcentration map(s), ***if required for site investigation (SI)*** *(*8.5x14" if paper copy*)*. The isoconcentration map should have flow direction and extent of groundwater contamination defined. **If not available, include the latest extent of contaminant plume map.**	x
GW: Table of water level elevations, with sampling dates, and free product noted if present	x
GW: Latest groundwater flow direction/monitoring well location map (should be 2 maps if maximum variation in flow direction is greater than 20 degrees)	x
SOIL: Latest horizontal extent of contamination exceeding generic or SSRCLs, with one contour	x
Geologic cross-sections, ***if required for SI.*** (8.5x14' if paper copy)	x
RP certified statement that legal descriptions are complete and accurate.	x
Copies of off-source notification letters (if applicable)	na
Letter informing ROW owner of residual contamination (Contaminated section of Buffalo Street deeded to railroad)	na
Copy of (soil or land use) deed restriction (s) or deed notice if any required as a condition of closure	na
Copy of any maintenance plan referenced in the deed restriction	na

ENVIRONMENTAL & REGULATORY SERVICES DIVISION
BUREAU OF PECFA
2129 Jackson Street
Oshkosh, Wisconsin 54901-1805
TDD #: (608) 264-8777
Fax #: (920) 424-0217
Jim Doyle, Governor
Mary P. Burke, Secretary

commerce.wi.gov
Wisconsin
Department of Commerce

October 17, 2005

Ms. Nina Sayyat
Canadian National Railway
Macmillan Administration Building
1 Administration Road
Concord Ontario L4K 1B9, CN

RE: **Final Closure**

Commerce # 54220-4621-14 WDNR BRRTS # 03-36-001962
Holmes Oil Corp., 1114 Buffalo Street, Manitowoc

Dear Ms. Sayyat:

The Wisconsin Department of Commerce (Commerce) has received the items required as the condition for closure of the site referenced above. This case is now listed as "closed" on the Commerce database and will be included on the Wisconsin Department of Natural Resources (WDNR) Geographic Information System (GIS) Registry of Closed Remediation Sites to address residual soil and groundwater contamination. It is in your best interest to keep all documentation related to the environmental activities that were conducted.

If residual contamination is encountered in the future, it must be managed in accordance with all applicable state and federal regulations. If it is determined that any remaining contamination poses a threat, the case may be reopened and further investigation or remediation may be required.

Thank you for your efforts to bring this case to closure. If you have any questions, please contact me in writing at the letterhead address or by telephone at (920) 424-0046.

Sincerely,

Robert H. Klauk
Robert H. Klauk
Hydrogeologist
Site Review Section

cc: Lynelle P. Caine - Northern Environmental Technologies, Inc.
Case File

ENVIRONMENTAL & REGULATORY SERVICES DIVISION
BUREAU OF PECFA
2129 Jackson Street
Oshkosh, Wisconsin 54901-1805
TDD #: (608) 264-8777
Fax #: (920) 424-0217
Jim Doyle, Governor
Mary P. Burke, Secretary

commerce.wi.gov

Wisconsin
Department of Commerce

September 15, 2005

Ms. Nina Sayyat
Canadian National Railway
Macmillan Administration Building
1 Administration Road
Concord Ontario L4K 1B9, CN

RE: **Conditional Case Closure**

Commerce # 54220-4621-14 WDNR BRRTS # 03-36-001962
Holmes Oil Corp, 1114 Buffalo Street, Manitowoc

Dear Ms. Sayyat:

The Wisconsin Department of Commerce (Commerce) has reviewed the request for case closure, prepared by Northern Environmental Technologies, Inc., for the site referenced above. It is understood that residual soil and groundwater contamination remain on-site. Commerce has determined that this site does not pose a significant threat to the environment and human health. No further investigation or remedial action is necessary.

The following condition must be satisfied to obtain final closure:

- Documentation of the abandonment (WDNR Abandonment Form 3300-5B) groundwater monitoring wells MW-1 through MW-13.

This letter serves as your written notice of "no further action." Timely filing of your final PECFA claim is encouraged. If your claim is not received within 120 days of the date of this letter, interest costs incurred after 60 days of the date of this letter will not be eligible for PECFA reimbursement.

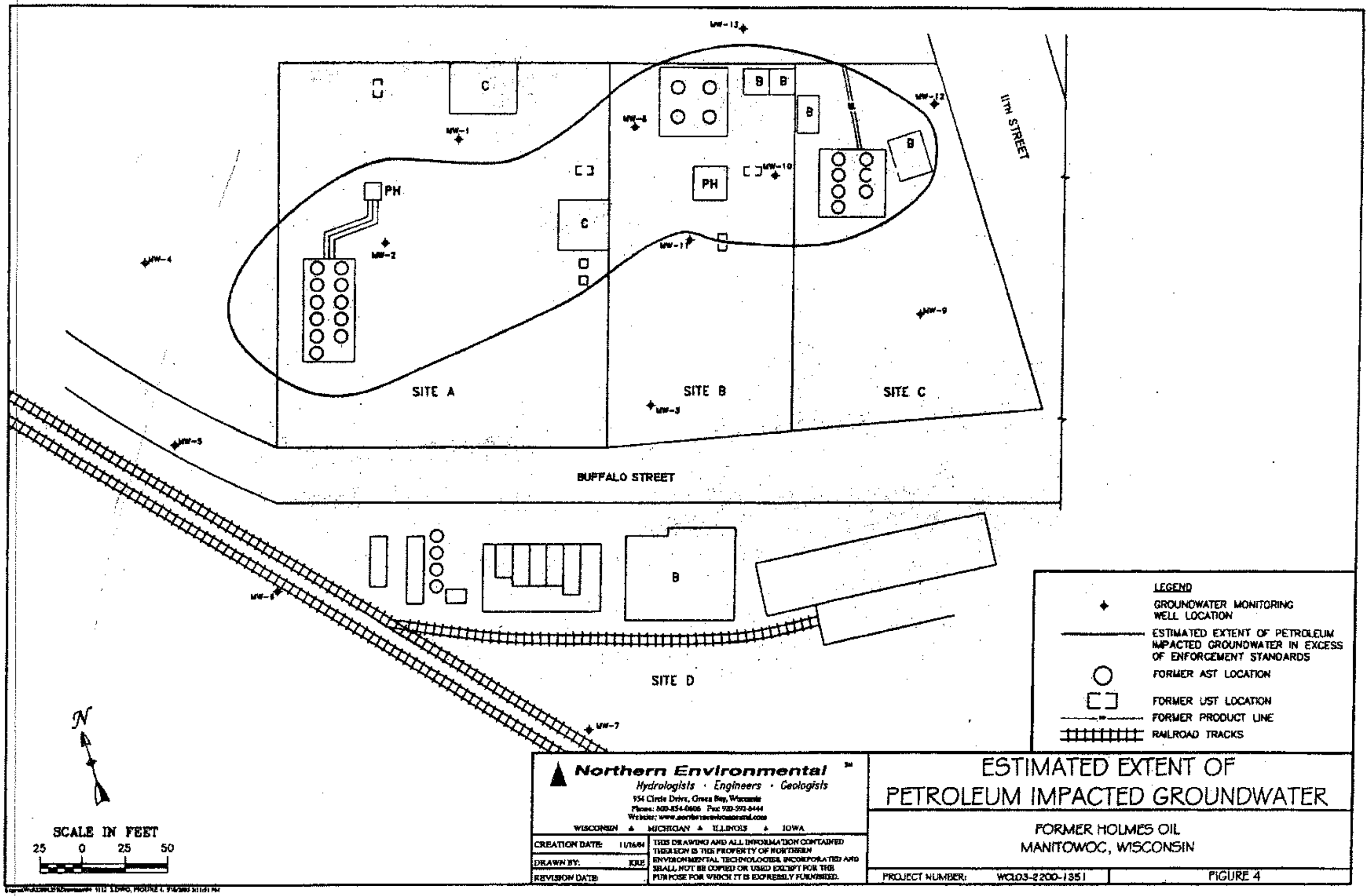
Thank you for your efforts to protect Wisconsin's environment. If you have any questions, please contact me in writing at the letterhead address or by telephone at (920) 424-0046.

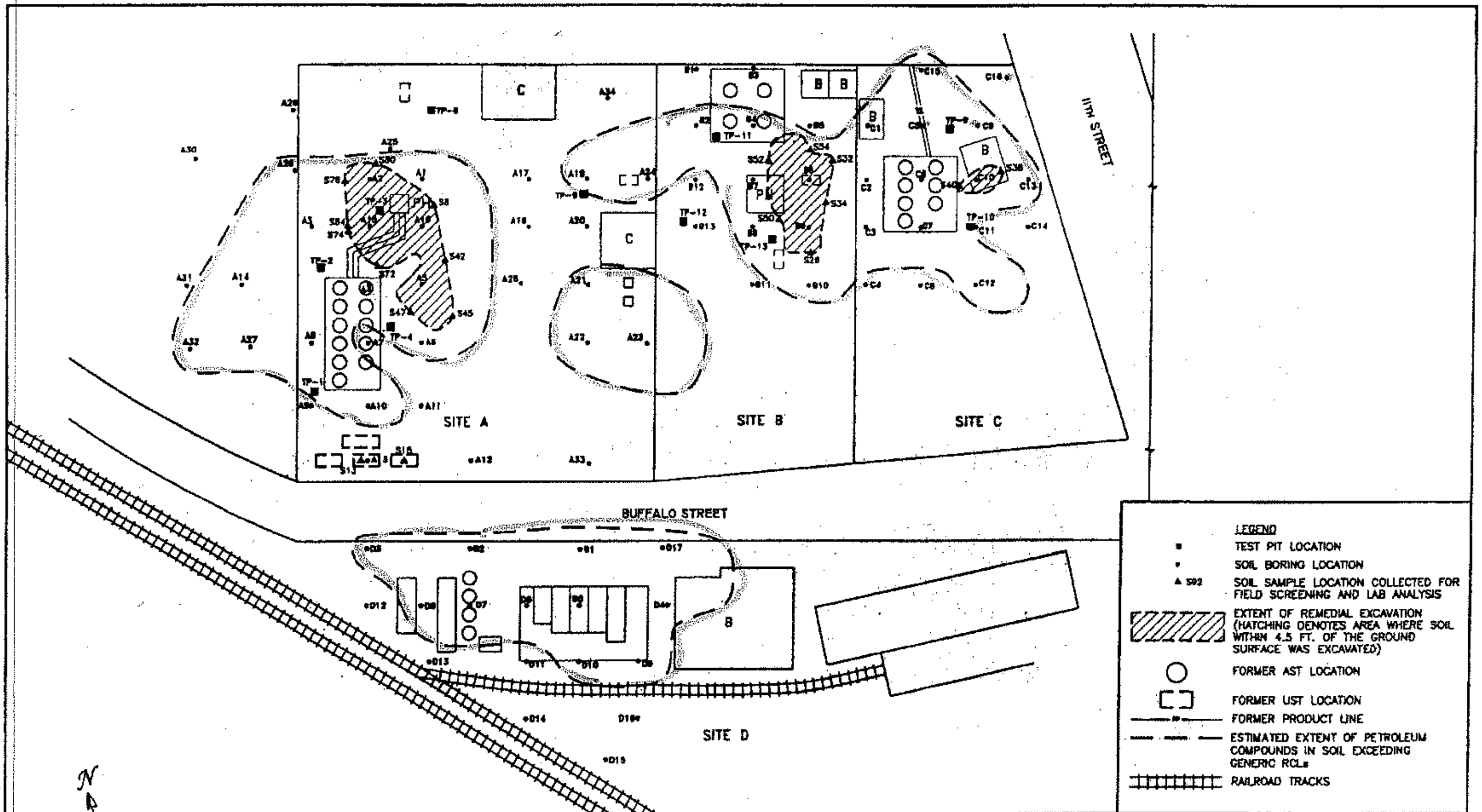
Sincerely,

Robert H. Klauk

Robert H. Klauk
Hydrogeologist
Site Review Section

cc: Lynelle P. Caine - Northern Environmental Technologies, Inc.
Case File


11TH STREET
BUFFALO STREET
SITE A
SITE B
SITE C
SITE D
MW-1
MW-2
MW-3
MW-4
MW-5
MW-6
MW-7
MW-8
MW-9
MW-10
MW-11
MW-12
MW-13
PH
PH
C
C
B
B
B
B
B
B
N
SCALE IN FEET
25 0 25 50
LEGEND
GROUNDWATER MONITORING WELL LOCATION
ESTIMATED EXTENT OF PETROLEUM IMPACTED GROUNDWATER IN EXCESS OF ENFORCEMENT STANDARDS
FORMER AST LOCATION
FORMER UST LOCATION
FORMER PRODUCT LINE
RAILROAD TRACKS
Northern Environmental
Hydrologists · Engineers · Geologists
WISCONSIN · MICHIGAN · ILLINOIS · IOWA
CREATION DATE: 11/16/04
DRAWN BY: KRE
REVISION DATE:
THIS DRAWING AND ALL INFORMATION CONTAINED THEREON IS THE PROPERTY OF NORTHERN ENVIRONMENTAL TECHNOLOGIES INCORPORATED AND SHALL NOT BE COPIED OR USED EXCEPT FOR THE PURPOSE FOR WHICH IT IS EXPRESSLY FURNISHED.
ESTIMATED EXTENT OF PETROLEUM IMPACTED GROUNDWATER
FORMER HOLMES OIL
MANITOWOC, WISCONSIN
PROJECT NUMBER: WC103-2200-1351
FIGURE 4



Northern Environmental
Hydrologists · Engineers · Geologists
954 Circle Drive, Green Bay, Wisconsin
WISCONSIN ▲ MICHIGAN ▲ ILLINOIS ▲ IOWA

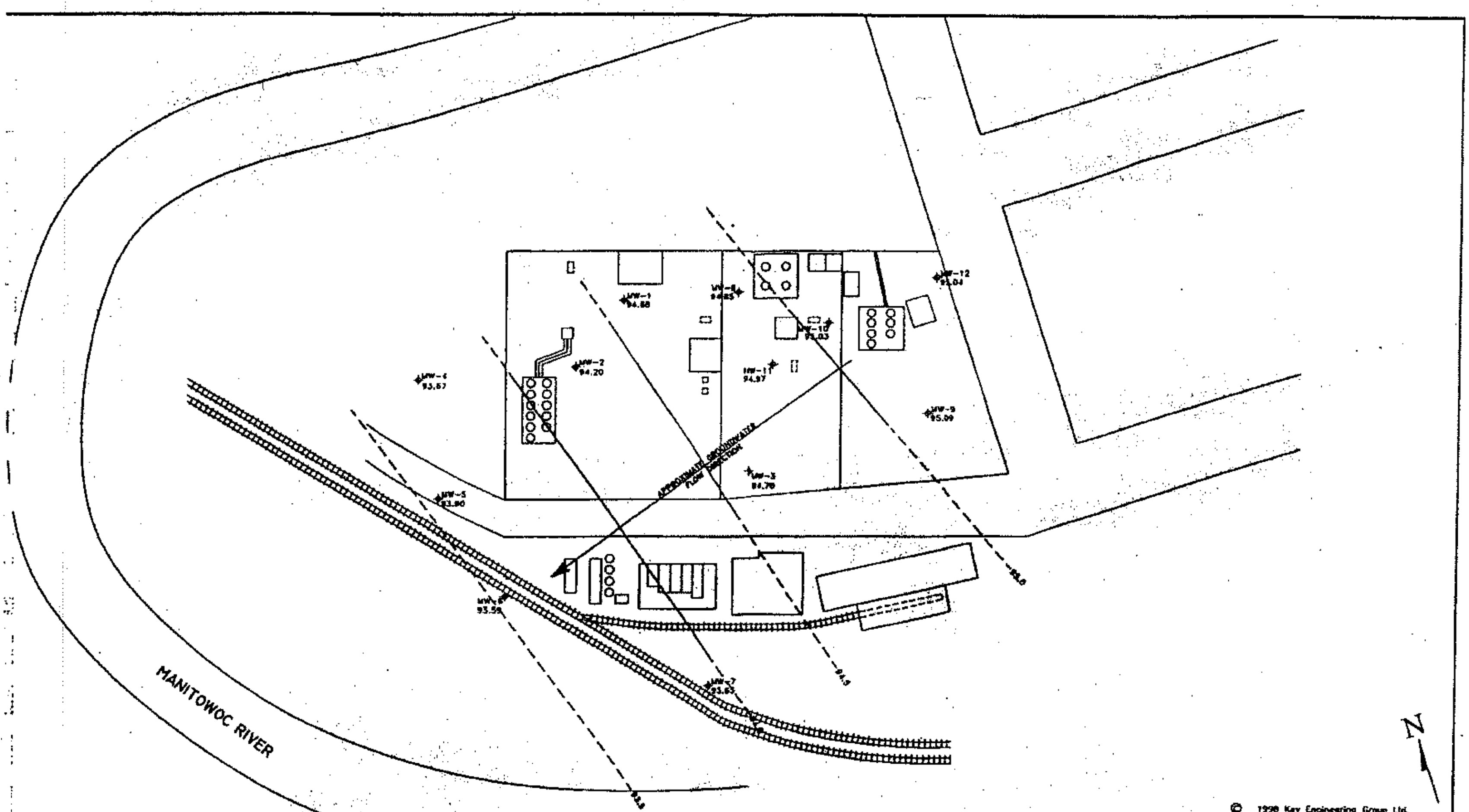
CREATION DATE:	11/12/04	THIS DRAWING AND ALL INFORMATION CONTAINED THEREON IS THE PROPERTY OF NORTHERN ENVIRONMENTAL TECHNOLOGIES, INCORPORATED AND SHALL NOT BE COPIED OR USED EXCEPT FOR THE PURPOSE FOR WHICH IT IS EXPRESSLY FURNISHED.
DRAWN BY:	KRB	
REVISION DATE:	11/16/04	

ESTIMATED EXTENT OF PETROLEUM IMPACTED SOIL

FORMER HOLMES OIL
MANITOWOC, WISCONSIN

PROJECT NUMBER: WC103-2200-1351

FIGURE 3



LEGEND

✦ GROUNDWATER MONITORING WELL LOCATION

94.20 GROUNDWATER ELEVATION (11/6/97)

DRN. BY:	S.L.G.	DATE:	05/13/98
DSN. BY:	M.P.M.	FILE NO.:	0411010
CHK. BY:	M.P.M.	DWG. NO.:	41101010
REV. BY:	G.L.J.	SHEET NO.:	4

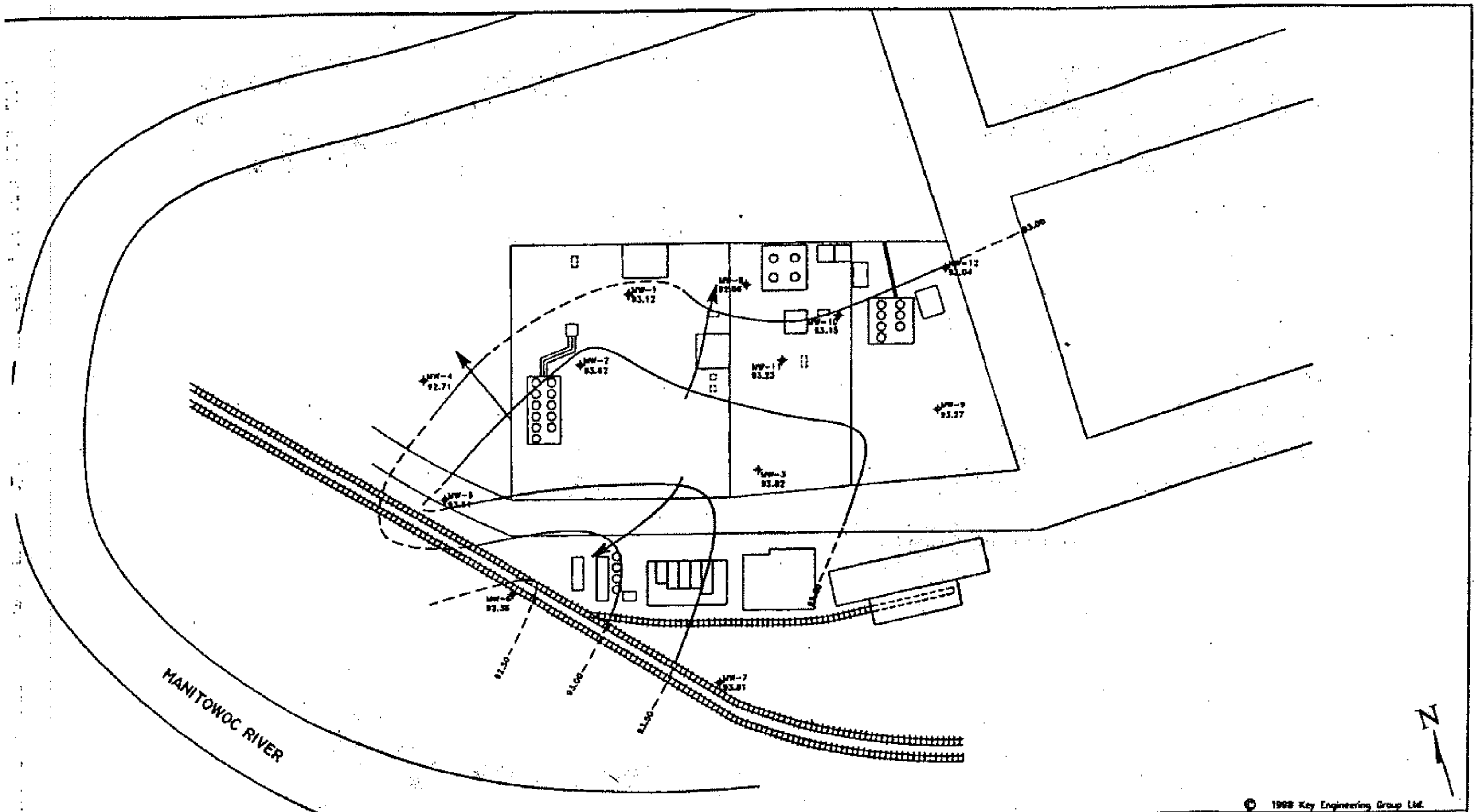
0 40 80

APPROXIMATE SCALE: 1"=80'

KEY ENGINEERING GROUP LTD.

FIGURE 4
GROUNDWATER ELEVATION CONTOUR MAP
(11/6/97)

SITE INVESTIGATION REPORT
FORMER HOLMES OIL
SITES A, B, C and D
MANITOWOC, WISCONSIN



LEGEND

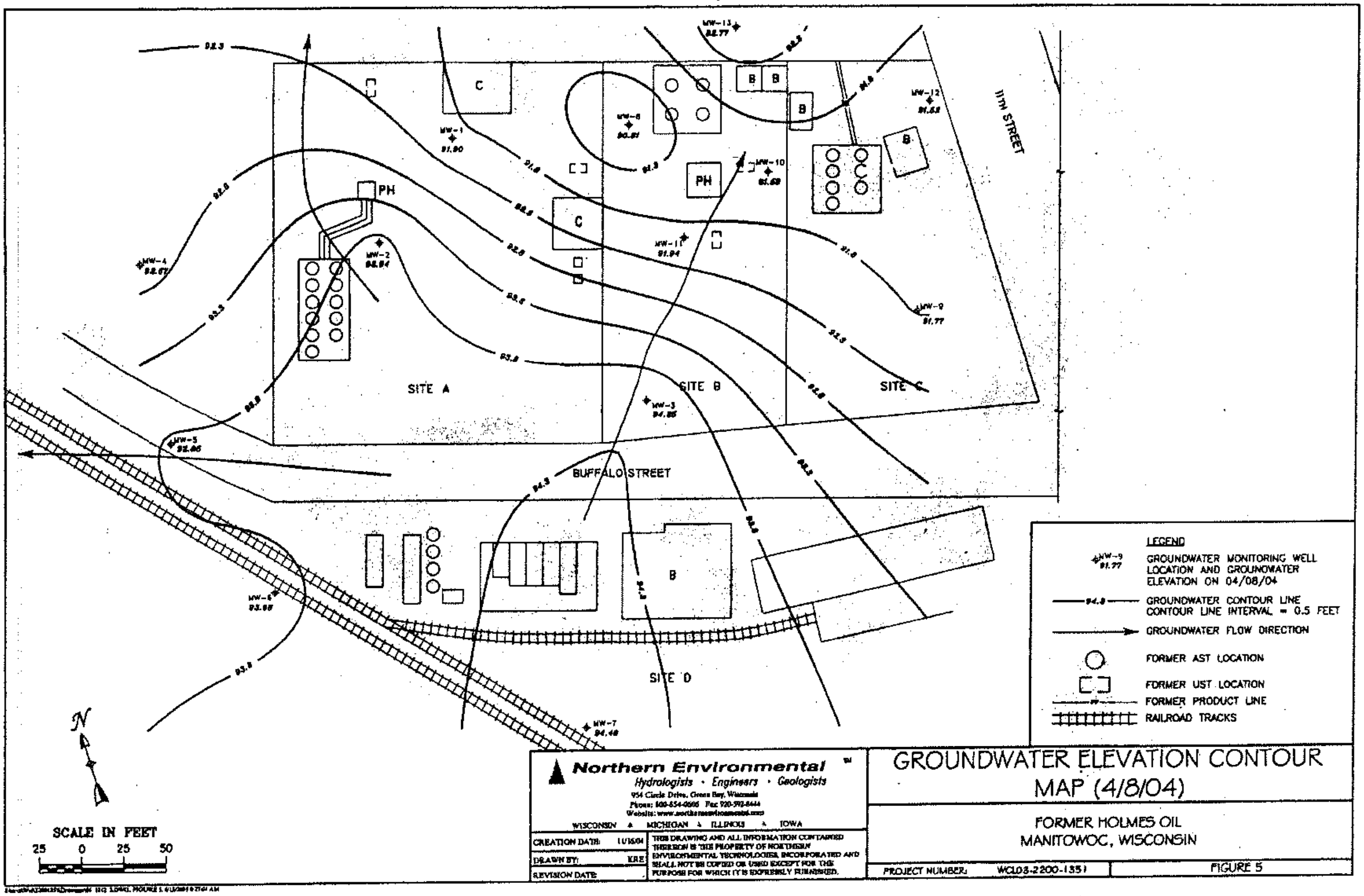
- GROUNDWATER MONITORING WELL LOCATION
- 2.36 GROUNDWATER ELEVATION (1/14/98)

DRN. BY:	S.L.G.	DATE:	05/13/98
DSN. BY:	M.P.M.	FILE NO.:	0411010
CHK. BY:	M.P.M.	DWG. NO.:	41101011
REV. BY:	G.L.J.	SHEET NO.:	5

KEY ENGINEERING GROUP LTD.

FIGURE 5
GROUNDWATER ELEVATION CONTOUR MAP (1/14/98)

SITE INVESTIGATION REPORT
FORMER HOLMES OIL
SITES A, B, C and D


11TH STREET
BUFFALO STREET
SITE A
SITE B
SITE C
SITE D
PH
C
B
MW-1
91.90
MW-6
90.81
MW-7
94.48
MW-9
91.77
SCALE IN FEET
25 0 25 50
N
LEGEND
GROUNDWATER MONITORING WELL LOCATION AND GROUNDWATER ELEVATION ON 04/08/04
GROUNDWATER CONTOUR LINE CONTOUR LINE INTERVAL = 0.5 FEET
GROUNDWATER FLOW DIRECTION
FORMER AST LOCATION
FORMER UST LOCATION
FORMER PRODUCT LINE
RAILROAD TRACKS
Northern Environmental
Hydrologists · Engineers · Geologists
WISCONSIN · MICHIGAN · ILLINOIS · IOWA
CREATION DATE: 11/16/04
DRAWN BY: KRE
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GROUNDWATER ELEVATION CONTOUR MAP (4/8/04)
FORMER HOLMES OIL
MANITOWOC, WISCONSIN
PROJECT NUMBER: WCL03-2200-1351
FIGURE 5

page 4

TABLE 1

SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS

SITE INVESTIGATION REPORT

FORMER HOLMES OIL - SITE C
308 North 11th Street
Manitowoc, Wisconsin

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C-11	C12	C13	C14	C15	C16
DATE	6/17/97	6/17/97	6/17/97	6/17/97	6/17/97	6/17/97	6/17/97	6/17/97	6/17/97	6/17/97	6/17/97	6/17/97	6/17/97	6/17/97	6/17/97	8/21/97
DEPTH (feet)	4-6	0-2	4-6	2-4	4-6	0-2	4-6	2-4	4-6	2-4	4-6	4-6	4-6	2-4	3	2
PID (i.u.)	1,478	42	799	3	18	1	3	3	399	130	3	3	3	3	167	<1
GRO (mg/kg)	2,240	238	3,000	<2.3	95	<2.0	<2.1	<2.2	1,680	69	<2.1	<2.1	3	<2.1	345	<1.5
DRO (mg/kg)	1,350	189	3,950	27	51	233	73	12	7,690	207	43	24	400	52	509	12
LEAD (mg/kg)	11	48	<2.7	7.7	3.5	191	13	9.7	6.3	13	8.4	7.2	9	8.2	6.4	12
Benzene (ug/kg)	<347	<37	6,420	<18	<17	<16	66	<18	646	3,010	<17	110	<18	<17	<18	<19
Toluene (ug/kg)	2,050	63	1,830	<10	<9.3	82	216	<9.9	690	8,600	68	545	34	71	<9.8	<10
Ethylbenzene (ug/kg)	30,400	1,720	30,800	<4.1	495	<3.7	52	<4.0	2,840	1,640	<13.8	110	<4.1	<3.9	<4.0	<4.3
Xylenes (ug/kg)	102,500	4,160	66,070	21.7	417	156	411	42	19,240	9,120	51	938	82	91	38	<21.9
TMBs (ug/kg)	88,300	10,440	84,600	<14.8	2,814	72	163	<14.4	48,200	3,363	13.8	277	<14.6	<14.3	<14.3	<14.3
MTBE (ug/kg)	<233	<25	<547	<12	<11	<11	<12	<12	<115	<45	<11	<12	<12	<12	<12	<13
Naphthalene (ug/kg)	14,000	1,020	7,070	<13	534	170	318	42	16,800	1,750	75	570	47	74	157	<14
Isopropylbenzene (ug/kg)	3,260	409	3,430	<7.7	219	<6.9	<7.2	<7.5	1,090	<28	<7.1	<7.2	<7.5	<7.3	<7.4	<7.9

Notes:
DRO - diesel range organics
GRO - gasoline range organics
i.u. - instrument units
mg/kg - milligrams per kilogram
MTBE - methyl tert butyl ether
PID - photionization detector
TMBs - trimethylbenzenes
ug/kg - micrograms per kilogram

Table 4 Groundwater Analytical Results, Former Holmes Oil, Manitowoc, Wisconsin

Well ID	Date Sampled	Relevant and Significant VOC Analytical Results (µg/l) DRO	GRO	Lead	Benzene	n-Butylbenzene	tert-Butylbenzene	1,2-Dichloroethane	Ethylbenzene	Isopropylbenzene	p-Isopropyltoluene	MTBE	Naphthalene	n-Propylbenzene	Toluene	Trimethylbenzene	Vinyl Chloride	Xylenes
NR 140 Preventive Action Limit (µg/l)		NE	NE	1.5	0.5	NE	NE	0.5	140	NE	NE	12	8	NE	200	96	0.02	1,000
NR 140 Enforcement Standard (µg/l)		NE	NE	15	5	NE	NE	5	700	NE	NE	60	40	NE	1,000	480	0.2	10,000
MW1	08/27/97	320	< 50	< 1.5	3.4	< 0.50	< 0.50	< 0.50	0.52	< 0.50	< 0.50	3.7	< 8.0	< 0.50	< 0.50	< 2.0	< 0.17	0.53
Pre-Excavation	01/14/98	930	< 50	< 1.7	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	16	< 8.0	< 0.50	< 0.50	< 2.0	< 0.17	< 0.50
Post-Excavation	06/26/03	---	---	---	< 0.30	---	---	---	< 0.60	---	---	< 0.58	< 0.58	---	< 0.58	< 1.18	---	< 1.84
	09/17/03	---	---	---	< 0.30	---	---	---	< 0.60	---	---	0.68 J	---	---	< 0.58	< 1.18	---	< 1.84
	01/07/04	---	---	---	< 0.30	---	---	---	< 0.60	---	---	< 0.58	---	---	< 0.58	< 1.18	---	< 1.84
	04/08/04	---	---	---	< 0.14	---	---	---	< 0.40	---	---	< 0.36	---	---	< 0.36	< 0.79	---	< 1.10
MW2	08/27/97	350	10,000	< 1.5	250	44	< 25	< 25	270	< 25	< 25	37	< 400	32	< 25	429	< 8.5	1,000
Pre-Excavation	01/14/98	5,700	12,000	3.8	840	120	< 50	< 0.50	830	< 50	< 50	< 20	< 800	86	< 0.50	1,850	< 17	2,800
Post-Excavation	06/26/03	---	---	---	900	---	---	---	1,000	---	---	17 J	550	---	42	1,820	---	3,082
	09/17/03	---	---	---	910	---	---	---	850	---	---	24 J	580	---	21 J	2,060	---	2,463
	01/07/04	---	---	---	1,100	---	---	---	830	---	---	26	460	---	24	1,900	---	2,457
	04/08/04	---	---	---	500	---	---	---	1,400	---	---	< 7.2	770	---	39	2,850	---	4,310
MW3	08/27/97	2,700	540	< 1.5	< 0.50	< 0.50	< 0.50	< 0.50	0.55	< 0.50	< 0.50	< 0.20	< 8.0	0.52	< 0.50	< 2.0	< 0.17	1.7
Pre-Excavation	01/14/98	390	81	1.5	< 0.50	4.0	< 0.50	< 0.50	< 0.50	1.6	< 0.50	< 0.20	< 8.0	0.77	< 0.50	< 2.0	< 0.17	0.59
Post-Excavation	06/26/03	---	---	---	< 0.30	---	---	---	< 0.60	---	---	< 0.58	< 0.58	---	< 0.58	< 1.18	---	< 1.84
	01/07/04	---	---	---	< 0.30	---	---	---	< 0.60	---	---	< 0.58	---	---	< 0.58	< 1.18	---	< 1.84
MW4	08/27/97	< 100	< 50	< 1.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	1.0	1.1	< 8.0	< 0.50	0.68	< 2.0	< 0.17	3.0
Pre-Excavation	01/14/98	130	< 50	1.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	1.5	1.7	< 8.0	< 0.50	< 0.50	< 2.0	< 0.17	0.96
Post-Excavation	06/26/03	---	---	---	< 0.30	---	---	---	< 0.60	---	---	< 0.58	< 0.58	---	< 0.58	< 1.18	---	< 1.84
	09/17/03	---	---	---	< 0.30	---	---	---	< 0.60	---	---	2.6	< 0.58	---	< 0.58	< 1.18	---	< 1.84
	01/07/04	---	---	---	< 0.30	---	---	---	< 0.60	---	---	3.7	< 0.58	---	< 0.58	< 1.18	---	< 1.84
	04/08/04	---	---	---	< 0.14	---	---	---	< 0.40	---	---	< 0.36	< 0.47	---	< 0.36	< 0.79	---	< 1.10

Table 4 Groundwater Analytical Results, Former Holmes Oil, Manitowoc, Wisconsin

Well ID	Date Sampled	DRO	GRO	Lead	Benzene	n-Butylbenzene	tert-Butylbenzene	1,2-Dichloroethane	Ethylbenzene	Isopropylbenzene	p-Isopropyltoluene	MTBE	Naphthalene	n-Propylbenzene	Toluene	Trimethylbenzene	Vinyl Chloride	Xylenes
		Relevant and Significant VOC Analytical Results (µg/l)																
NR 140 Preventive Action Limit (µg/l)		NE	NE	1.5	0.5	NE	NE	0.5	140	NE	NE	12	8	NE	200	96	0.02	1,000
NR 140 Enforcement Standard (µg/l)		NE	NE	15	5	NE	NE	5	700	NE	NE	60	40	NE	1,000	480	0.2	10,000
MW5	08/27/97	250	< 50	< 1.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.20	< 8.0	< 0.50	< 0.50	< 2.0	< 0.17	0.92
Pre-Excavation	01/14/98	150	< 50	1.6	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.20	< 8.0	< 0.50	< 0.50	< 2.0	< 0.17	< 0.50
Post-Excavation	06/26/03	—	—	—	< 0.30	—	—	—	< 0.60	—	—	< 0.58	< 0.58	—	< 0.58	< 1.18	—	< 1.84
	09/17/03	—	—	—	< 0.30	—	—	—	< 0.60	—	—	< 0.58	< 0.58	—	< 0.58	< 1.18	—	< 1.84
	01/07/04	—	—	—	< 0.30	—	—	—	< 0.60	—	—	< 0.58	< 0.58	—	< 0.58	< 1.18	—	< 1.84
MW6	08/27/97	110	< 50	< 1.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.20	< 8.0	< 0.50	< 0.50	< 2.0	< 0.17	0.95
Pre-Excavation	01/14/98	< 100	< 50	1.7	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 8.0	< 0.50	< 0.50	< 2.0	< 0.17	< 0.50
Post-Excavation	06/26/03	—	—	—	< 0.30	—	—	—	< 0.60	—	—	< 0.58	< 0.58	—	< 0.58	< 1.18	—	< 1.84
	01/07/04	—	—	—	< 0.30	—	—	—	< 0.60	—	—	< 0.58	—	—	< 0.58	< 1.18	—	< 1.84
MW7	08/27/97	140	< 50	< 1.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	13	< 0.20	< 8.0	< 0.50	< 0.50	< 2.0	< 0.17	1.4
Pre-Excavation	01/14/98	< 100	< 50	< 1.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	8.7	< 0.20	< 8.0	< 0.50	< 0.50	< 2.0	< 0.17	< 0.50
Post-Excavation	06/26/03	—	—	—	< 0.30	—	—	—	< 0.60	—	—	< 0.58	< 0.58	—	< 0.58	< 1.18	—	< 1.84
MW8	08/27/97	910	400	< 1.5	100	< 0.50	< 0.50	< 25	12	4.2	< 0.50	< 0.20	< 8.0	6.2	3.2	8.4	< 0.17	34
Pre-Excavation	01/14/98	370	180	< 1.5	15	2.6	< 0.50	< 0.50	2.2	1.6	< 0.50	< 0.20	< 8.0	2.6	< 0.50	< 2.0	< 0.17	4.3
Post-Excavation	06/26/03	—	—	—	190	—	—	—	49	—	—	3.9	9.4	—	7.5	63.7	—	184
	09/17/03	—	—	—	280	—	—	—	28	—	—	6.3	6.7	—	9.3	42.8	—	173.2
	01/07/04	—	—	—	170	—	—	—	14	—	—	1.8 J	9.3	—	4.0	44.7	—	82.2 J
	04/08/04	—	—	—	8.2	—	—	—	1.7	—	—	0.40 J	0.87 J	—	< 0.36	12.53 J	—	7.3
MW9	08/27/97	100	< 50	< 1.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.20	< 8.0	< 0.50	< 0.50	1.1	< 0.17	1.9
Pre-Excavation	01/14/98	< 100	< 50	< 1.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.20	< 80	< 0.50	< 0.50	< 2.0	< 0.17	< 0.50
Post-Excavation	06/26/03	—	—	—	< 0.30	—	—	—	< 0.60	—	—	< 0.58	< 0.58	—	< 0.58	< 1.18	—	< 1.84
	01/07/04	—	—	—	< 0.30	—	—	—	< 0.60	—	—	< 0.58	—	—	< 0.58	< 1.18	—	< 1.84

Table 4 Groundwater Analytical Results; Former Holmes Oil, Manitowoc, Wisconsin

Well ID	Date Sampled	Relevant and Significant VOC Analytical Results (µg/l)																
		DRO	GRO	Lead	Benzene	n-Butylbenzene	tert-Butylbenzene	1,2-Dichloroethane	Ethylbenzene	Isopropylbenzene	p-Isopropyltoluene	MTBE	Naphthalene	n-Propylbenzene	Toluene	Trimethylbenzene	Vinyl Chloride	Xylenes
NR 140 Preventive Action Limit (µg/l)		NE	NE	1.5	0.5	NE	NE	0.5	140	NE	NE	12	8	NE	200	96	0.02	1,000
NR 140 Enforcement Standard (µg/l)		NE	NE	15	5	NE	NE	5	700	NE	NE	60	40	NE	1,000	480	0.2	10,000
MW10	08/27/97	470	820	< 1.5	96	12	< 0.50	< 0.50	94	3.8	1.2	< 0.20	23	8.6	9.2	100	23	270
Pre-Excavation	01/14/98	690	2,100	< 1.5	470	34	< 5.0	< 5.0	240	8.8	< 5.0	< 2.0	< 80	16	26	112	< 1.7	170
Post-Excavation	06/26/03	—	—	—	33	—	—	—	4.1	—	—	5.1	< 0.58	—	< 0.58	0.70 J	—	< 1.84
	09/17/03	—	—	—	100	—	—	—	4.7	—	—	4.4	—	—	4.4	35.0	—	35.4 J
	01/07/04	—	—	—	17	—	—	—	< 0.60	—	—	1.9 J	—	—	< 0.58	< 1.18	—	< 1.84
	04/08/04	—	—	—	31	—	—	—	4.7	—	—	6.1	—	—	0.69 J	1.4	—	< 1.10
MW11	08/27/97	1,600	620	< 1.5	18	34	< 1.3	< 1.3	1.4	12	< 1.3	< 0.50	< 20	16	3.5	145	< 0.43	130
Pre-Excavation	01/14/98	10,000	1,700	< 1.5	16	39	< 0.50	0.70	23	9.6	< 0.50	29	< 80	34	1.4	75	< 0.17	54
Post-Excavation	06/26/03	—	—	—	< 0.30	—	—	—	< 0.60	—	—	< 0.58	4.6	—	< 0.58	0.67 J	—	< 1.84
	09/17/03	—	—	—	< 0.30	—	—	—	< 0.60	—	—	< 0.58	—	—	< 0.58	< 1.18	—	< 1.84
	01/07/04	—	—	—	< 0.30	—	—	—	< 0.60	—	—	< 0.58	—	—	< 0.58	< 1.18	—	< 1.84
	04/08/04	—	—	—	< 0.14	—	—	—	< 0.40	—	—	< 0.36	—	—	< 0.36	0.79 J	—	< 1.10
MW12	08/27/97	770	680	< 1.5	2.6	11	1.7	< 0.50	6.0	4.6	4.8	< 0.20	< 8.0	1.2	1.7	46.2	< 0.17	7.4
Pre-Excavation	01/14/98	390	710	< 1.5	2.5	8.7	1.2	< 0.50	7.6	5.3	3.4	< 0.20	39	1.8	1.5	29.6	< 0.17	2.3
Post-Excavation	06/26/03	—	—	—	0.54 J	—	—	—	< 0.60	—	—	< 0.58	2.2	—	< 0.58	< 1.18	—	< 1.84
	09/17/03	—	—	—	< 0.30	—	—	—	< 0.60	—	—	< 0.58	—	—	< 0.58	< 1.18	—	< 1.84
	01/07/04	—	—	—	< 0.30	—	—	—	< 0.60	—	—	< 0.58	—	—	< 0.58	< 1.18	—	< 1.84
	04/08/04	—	—	—	4.4	—	—	—	7.3	—	—	0.49 J	—	—	0.74 J	49	—	6.4

Table 4 Groundwater Analytical Results, Former Holmes Oil, Manitowoc, Wisconsin

Well ID	Date Sampled	Relevant and Significant VOC Analytical Results (µg/l)																
		DRO	GRO	Lead	Benzene	n-Butylbenzene	tert-Butylbenzene	1,2-Dichloroethane	Ethylbenzene	Isopropylbenzene	p-Isopropyltoluene	MTBE	Naphthalene	n-Propylbenzene	Toluene	Trimethylbenzene	Vinyl Chloride	Xylenes
NR 140 Preventive Action Limit (µg/l)		NE	NE	1.5	0.5	NE	NE	0.5	140	NE	NE	12	8	NE	200	96	0.02	1,000
NR 140 Enforcement Standard (µg/l)		NE	NE	15	5	NE	NE	5	700	NE	NE	60	40	NE	1,000	480	0.2	10,000
MW13	06/26/03	—	—	—	< 0.30	—	—	—	< 0.60	—	—	2.6	< 0.58	—	< 0.58	< 1.18	—	< 1.84
	09/17/03	—	—	—	< 0.30	—	—	—	< 0.60	—	—	< 0.58	—	—	< 0.58	< 1.18	—	< 1.84
	01/07/04	—	—	—	< 0.30	—	—	—	< 0.60	—	—	5.0	—	—	0.90 J	< 1.18	—	< 1.84
	04/08/04	—	—	—	< 0.14	—	—	—	< 0.40	—	—	< 0.36	—	—	< 0.36	< 0.79	—	< 1.10

Key:

MTBE = Methyl-Tertiary-Butyl-Ether
µg/l = micrograms per liter
msl = Mean Sea Level
J = Analyte detected between Limit of Detection and Limit of Quantitation
fbg = Feet Below Grade
NE = Not Established by Wis. Adm. Code

DRO = Diesel Range Organics
GRO = Gasoline Range Organics
VOC = Volatile Organic Compounds
— = Not Analyzed
$\boxed{32}$ = Exceeds NR 140 Preventive Action Limit
$\boxed{32}$ = Exceeds NR 140 Enforcement Standard

APPENDIX C

WWES IN-SITU STABILIZATION OF COAL IMPACTED SOILS DRAWINGS (SHEETS C1 THROUGH C4, S1 AND S2)

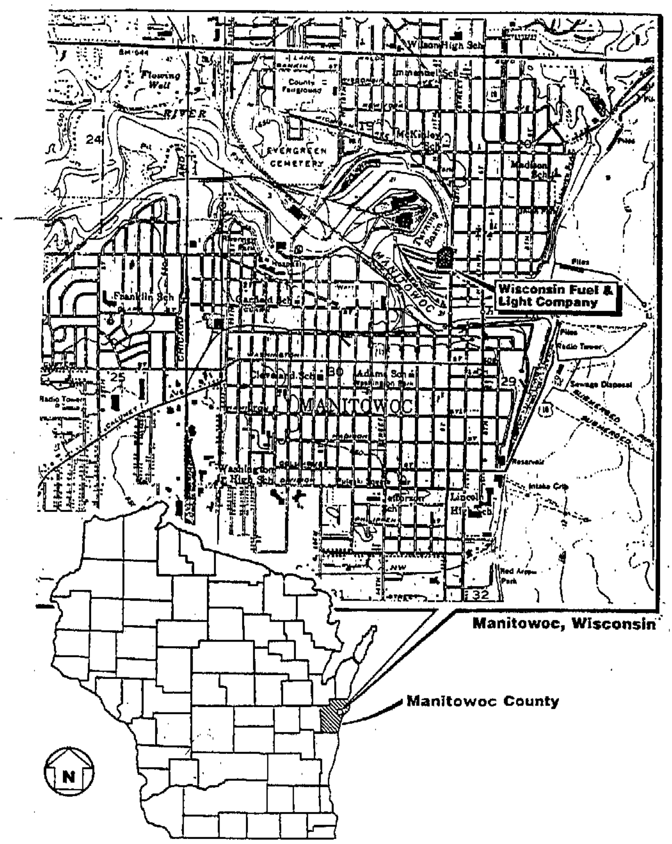
WISCONSIN FUEL & LIGHT COMPANY
MANITOWOC, WISCONSIN

IN SITU STABILIZATION/SOLIDIFICATION OF COAL TAR IMPACTED SOILS

CONTRACT NO. 2

JUNE, 1993

PROJECT NO. 22574/63595



INDEX OF DRAWINGS

C1 REMEDIATION AREA - SITE PLAN
C2 CROSS SECTION LOCATION MAP - SITE PLAN
C3 REMEDIATION AREA CROSS SECTIONS - 1,2, AND 3
C4 REMEDIATION AREA CROSS SECTIONS - 4,5, AND 6

REFERENCE DRAWINGS

S1 RETAINING WALL ANCHOR SYSTEM - SITE PLAN
S2 RETAINING WALL ANCHOR SYSTEM - SECTION & DETAILS

WW Engineering & Science
A Summit Company
5555 Glenwood Hills Parkway, SE • P.O. Box 874 • Grand Rapids, MI 49588-0874 • (616) 942-9600

22574C0V
VR060393

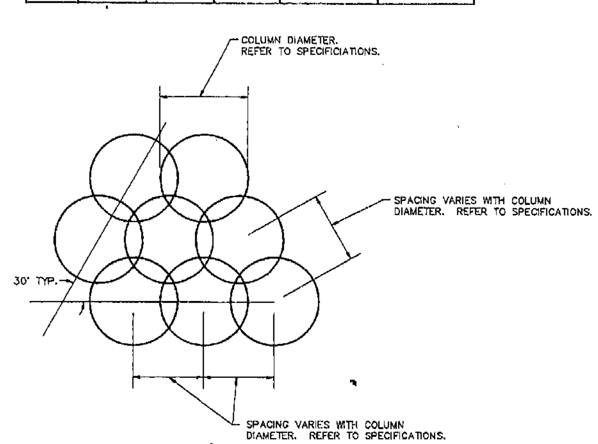
000.00 – EXIST ELEV. USGS DATUM
– WISCONSIN FUEL & LIGHT PROPERTY LINE
– WISCONSIN CENTRAL PROPERTY LINE
– PIEZOMETER
– MONITORING WELL
– LIMITS OF REMEDIATION
40' – THICKNESS OF REMEDIATION VOLUME
– WATER MAIN LOCATION
– SANITARY SEWER LOCATION
– STORM SEWER LOCATION
– CURB LINE
– TREATMENT PHASE BOUNDARY
– LIMITS OF CONSTRUCTION

NORTH

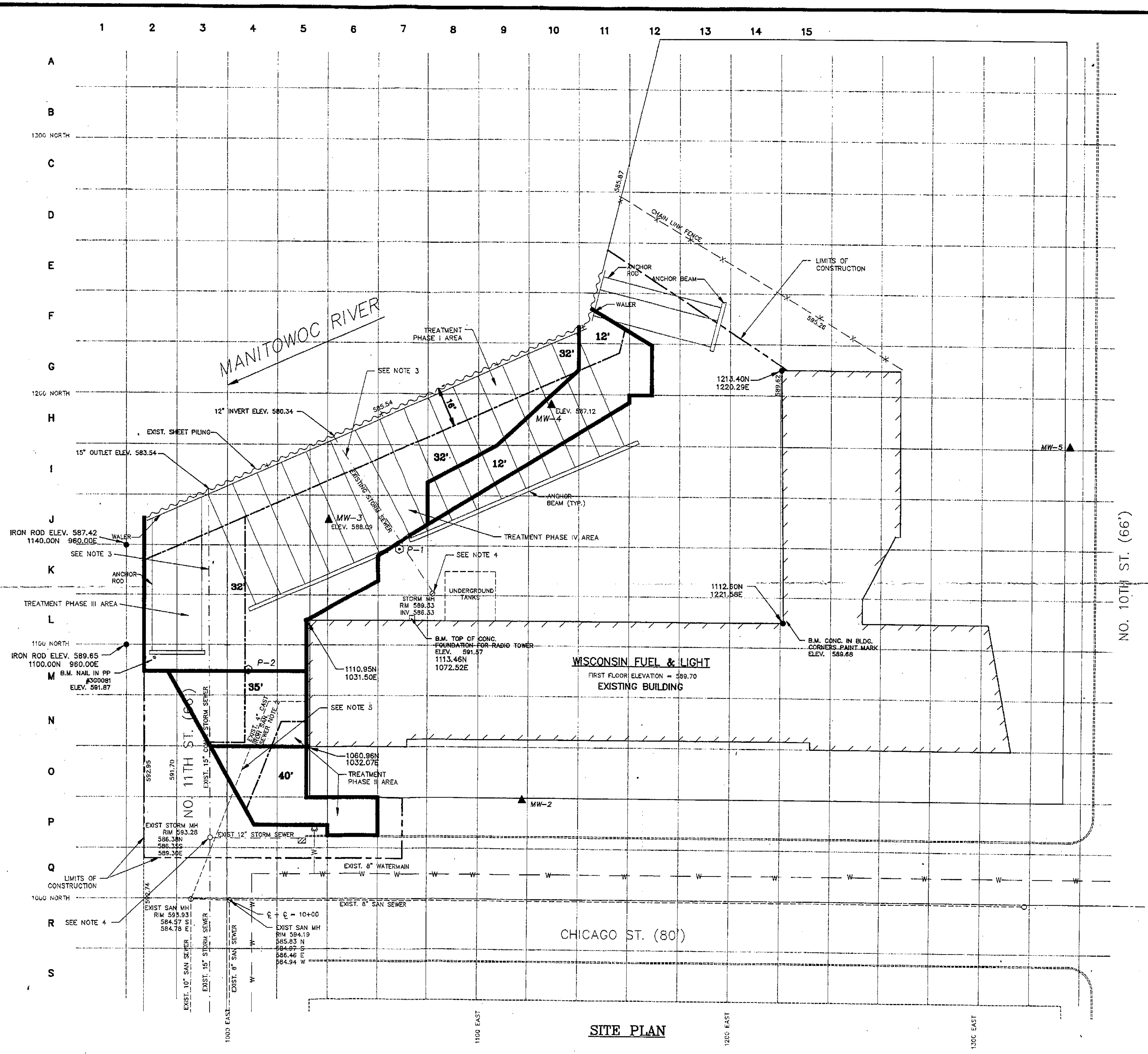
SCALE IN FEET 0 20

GRID SECTION AREAS & VOLUMES

GRID NO.	SECTION DEPTH (FT.)	SECTION AREA (SQ. FT.)	SECTION VOLUME (CU. YD.)	STABILIZATION UPPER ELEVATION (FT. above M.S.L.)	STABILIZATION LOWER ELEVATION (FT. above M.S.L.)
F-10	32	56	66	583.90	551.90
F-11	12	185	82	576.00	564.00
F-12	12	20	9	576.00	564.00
G-8	32	95	113	583.61	551.60
G-9	32	275	326	584.90	552.90
G-10	12	58	26	576.00	564.00
G-10	32	337	399	585.00	553.00
G-11	12	400	178	576.00	564.00
G-12	12	90	40	576.00	564.00
H-5	32	11	13	582.40	550.40
H-6	32	115	136	583.90	551.90
H-7	32	148	175	584.20	552.20
H-8	32	400	474	584.80	552.80
H-9	12	78	35	576.00	564.00
H-9	32	322	382	585.30	553.30
H-10	12	344	153	576.00	564.00
H-10	32	30	36	585.20	553.20
H-11	12	165	73	576.00	564.00
I-3	32	38	45	583.25	551.25
I-4	32	210	249	583.80	551.80
I-5	32	367	435	584.30	552.30
I-6	32	400	474	585.40	553.40
I-7	32	400	474	585.00	553.00
I-8	12	218	97	576.00	564.00
I-8	32	180	213	585.20	553.20
I-9	12	248	110	576.00	564.00
I-9	32	14	17	585.30	553.30
I-10	12	39	17	576.00	564.00
J-2	32	195	231	584.00	552.00
J-3	32	389	461	584.30	552.30
J-4	32	400	474	585.40	553.40
J-5	32	400	474	585.90	553.90
J-6	32	400	474	586.20	554.20
J-7	32	342	405	586.50	554.50
J-8	12	104	46	576.00	564.00
K-2	32	260	308	585.30	553.30
K-3	32	400	474	585.97	553.97
K-4	32	400	474	587.00	555.00
K-5	32	400	474	587.10	555.10
K-6	32	372	441	587.20	555.20
K-7	32	8	9	587.00	555.00
L-2	32	260	308	587.10	555.10
L-3	32	400	474	587.76	555.76
L-4	32	400	474	587.30	555.30
L-5	32	300	356	587.59	555.59
L-6	32	25	30	587.65	555.65
M-2	32	130	154	587.52	555.52
M-2	35	9	12	588.52	553.52
M-3	32	200	237	587.52	555.52
M-3	35	196	254	588.62	553.62
M-4	32	200	237	587.57	555.57
M-4	35	200	259	588.70	553.70
M-5	32	120	142	587.65	555.65
M-5	35	120	156	588.90	553.90
N-3	35	250	324	588.85	553.85
N-4	35	400	519	589.60	554.60
N-5	35	240	311	590.00	555.00
O-3	40	40	59	590.22	550.22
O-4	40	382	566	590.60	550.60
O-5	40	240	356	591.08	551.08
P-4	40	141	209	591.08	551.08
P-5	40	230	341	591.20	551.20
P-6	40	300	444	591.20	551.20
TOTALS		14,896	15,815		



DETAIL – TYPICAL TREATMENT COLUMN LAYOUT
NOT TO SCALE



SITE PLAN

NOTES:
1. REFER TO REFERENCE DRAWINGS S1 AND S2 FOR LOCATION AND DEPTH OF NEW RETAINING WALL ANCHORING SYSTEM.
2. SHOWN IS APPROXIMATE LOCATION OF 4" CAST IRON SANITARY SEWER. CONTRACTOR SHALL FIELD VERIFY LOCATION BEFORE COMMENCING WORK IN TREATMENT PHASE II AREA.
3. REMOVE EXISTING STORM SEWER WITHIN THE LIMITS OF REMEDIATION.
4. INSTALL TEMPORARY PUMP STATIONS IN NOTED MANHOLES.
5. EXISTING SANITARY SEWER TO BE REMOVED AND A NEW SANITARY SEWER TO BE INSTALLED BY OWNER IMMEDIATELY AFTER TREATMENT PHASE II AREA WORK IS COMPLETED. REFER TO SPECIFICATIONS.

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NO.	REVISIONS	BY	DATE	NO.	REVISIONS	BY	DATE
	ISSUED FOR CONSTRUCTION		6/7/93				

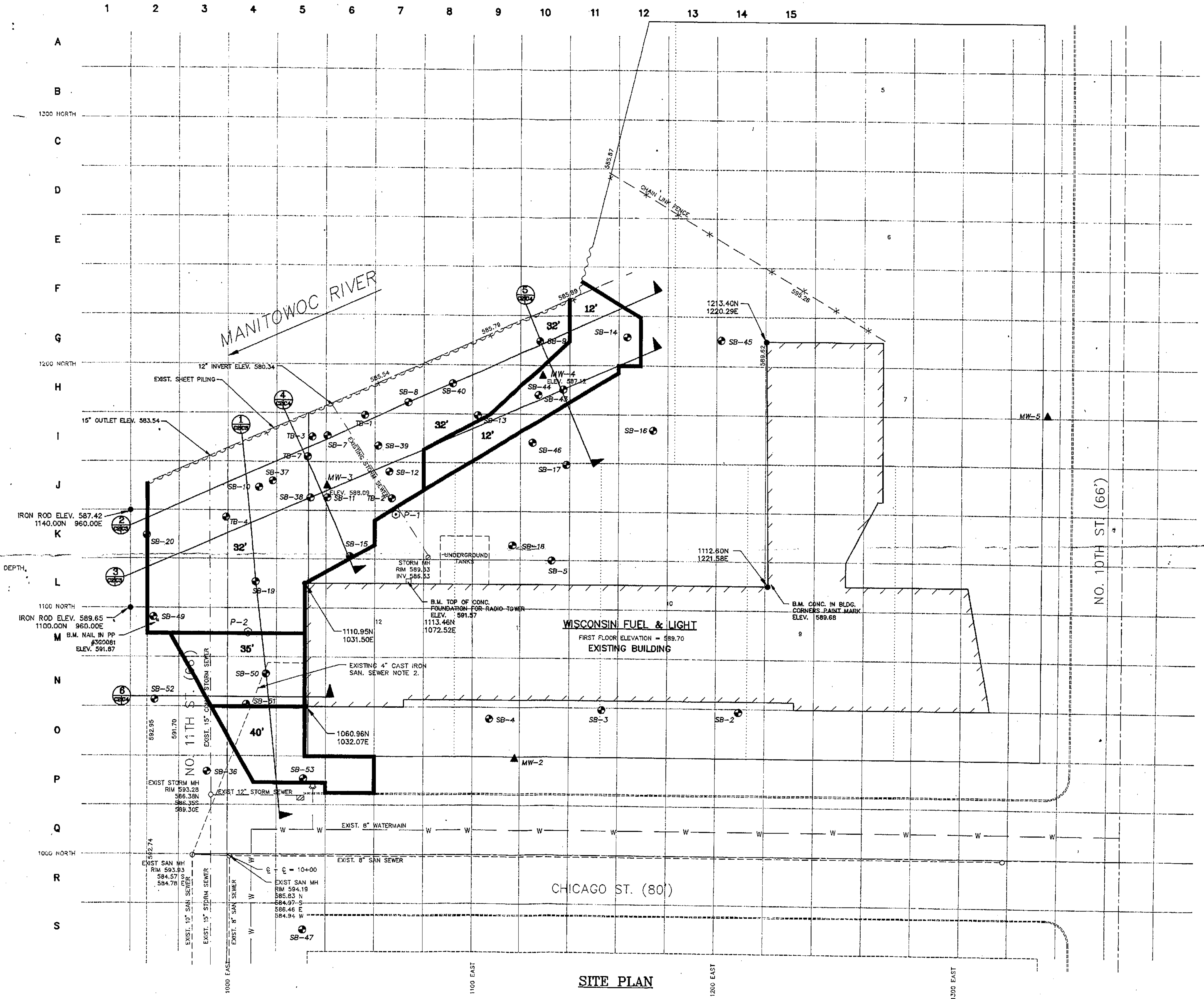
REVISED IN ACCORDANCE WITH CONSTRUCTION RECORDS BY DATE

WISCONSIN FUEL & LIGHT COMPANY
MANITOWOC, WISCONSIN
IN SITU SOIL STABILIZATION

REMEDIATION AREA – SITE PLAN

DESIGNED BY MAL	DATE MAY, '93
DRAWN BY VR	DATE MAY, '93
CHECKED BY SST	DATE MAY, '93
FILE 22574C1	EDIT VR060393
SCALE	1" = 20'-0"
	DRAWING 1:1
	PLOT
PROJECT	22574

C1
SHEET NO.



SITE PLAN

NORTH

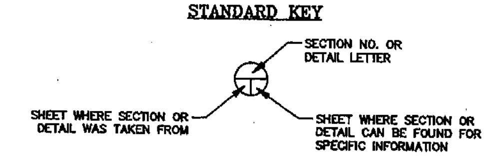
SCALE IN FEET
0 20

000.00 – EXIST ELEV. USGS DATUM

- LOT LINE
- WISCONSIN FUEL & LIGHT PROPERTY LINE
- WISCONSIN CENTRAL PROPERTY LINE
- PIEZOMETER
- MONITORING WELL
- SOIL BORING LOCATION
- LIMITS OF REMEDIATION
- 32' – THICKNESS OF REMEDIATION VOLUME

NOTES:
1. REFER TO REFERENCE DRAWINGS S1 AND S2 FOR LOCATION AND DEPTH OF NEW RETAINING WALL ANCHORING SYSTEM.
2. SHOWN IS APPROXIMATE LOCATION OF 4" CAST IRON SANITARY SEWER. CONTRACTOR SHALL FIELD VERIFY LOCATION BEFORE COMMENCING WORK IN TREATMENT PHASE II AREA.

STANDARD KEY



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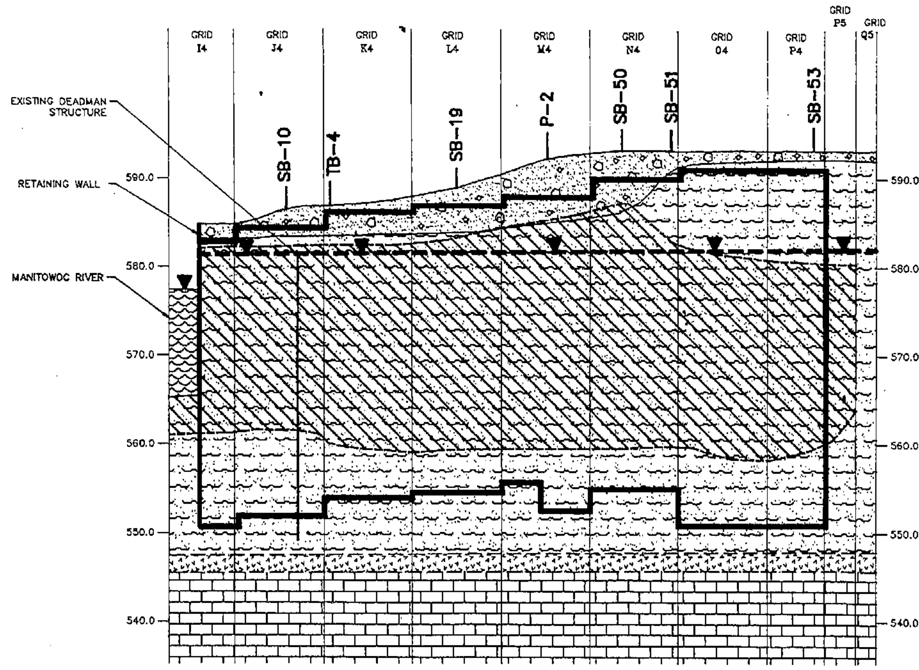
NO.	REVISIONS	BY	DATE
	ISSUED FOR CONSTRUCTION		
	REVISED IN ACCORDANCE WITH CONSTRUCTION RECORDS	BY	DATE

WISCONSIN FUEL & LIGHT COMPANY
MANITOWOC, WISCONSIN
IN SITU SOIL STABILIZATION
CROSS SECTION LOCATION MAP – SITE PLAN

DESIGNED BY MAL	DATE MAY, '93
DRAWN BY VR	DATE MAY, '93
CHECKED BY SST	DATE MAY, '93
FILE 22574C2	EDIT VR060293
SCALE 1" = 20'-0"	DRAWING 1:1
	PLOT
PROJECT	22574

C2
SHEET NO.



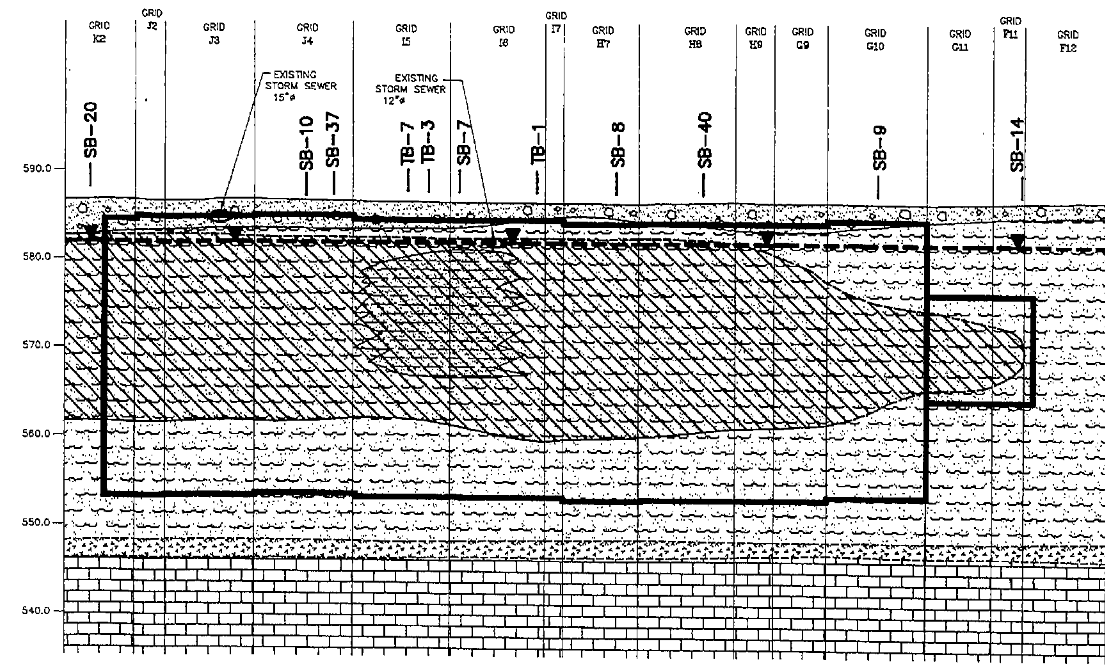
LEGEND

- COAL TAR & HEAVILY COAL TAR IMPACTED SOILS
- SAND
- SAND & GRAVEL
- SILTY SAND
- TILL
- BEDROCK
- MANITOWOC RIVER
- APPROXIMATE LOCATION OF WATER TABLE
- REMEDIATION BOUNDARY

NOTES:
1. RETAINING WALL ANCHOR SYSTEM NOT SHOWN IN CROSS SECTIONS. REFER TO REFERENCE DRAWINGS S1 AND S2 FOR LOCATION AND DEPTH.
2. REFER TO DRAWING C1 FOR GRID LOCATIONS.

HORIZONTAL SCALE – 1" = 20'
VERTICAL SCALE – 1" = 10'

1 C2C3 CROSS SECTION



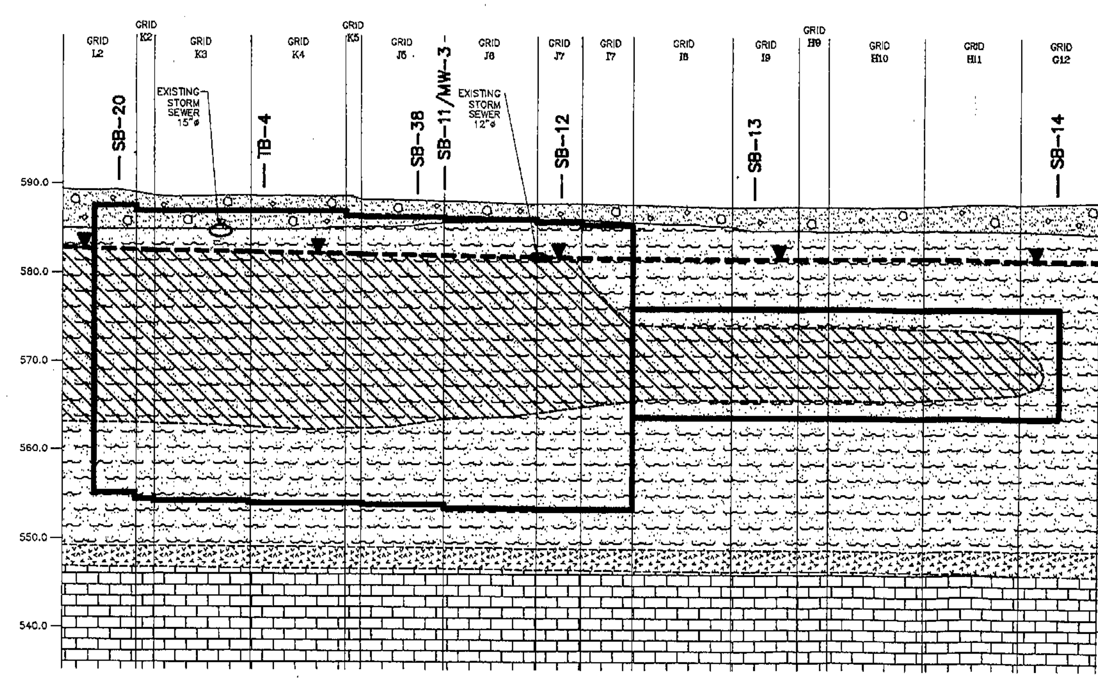
LEGEND

- COAL TAR & HEAVILY COAL TAR IMPACTED SOILS
- SAND & GRAVEL
- CLAYEY SAND
- SILTY SAND
- TILL
- BEDROCK
- APPROXIMATE LOCATION OF WATER TABLE
- REMEDIATION BOUNDARY

NOTES:
1. RETAINING WALL ANCHOR SYSTEM NOT SHOWN IN CROSS SECTIONS. REFER TO REFERENCE DRAWINGS S1 AND S2 FOR LOCATION AND DEPTH.
2. REFER TO DRAWING C1 FOR GRID LOCATIONS.

HORIZONTAL SCALE – 1" = 20'
VERTICAL SCALE – 1" = 10'

2 C2C3 CROSS SECTION



LEGEND

- COAL TAR & HEAVILY COAL TAR IMPACTED SOILS
- SAND & GRAVEL
- SILTY SAND
- TILL
- BEDROCK
- APPROXIMATE LOCATION OF WATER TABLE
- REMEDIATION BOUNDARY

NOTES:
1. RETAINING WALL ANCHOR SYSTEM NOT SHOWN IN CROSS SECTIONS. REFER TO REFERENCE DRAWINGS S1 AND S2 FOR LOCATION AND DEPTH.
2. REFER TO DRAWING C1 FOR GRID LOCATIONS.

HORIZONTAL SCALE – 1" = 20'
VERTICAL SCALE – 1" = 10'

3 C2C3 CROSS SECTION

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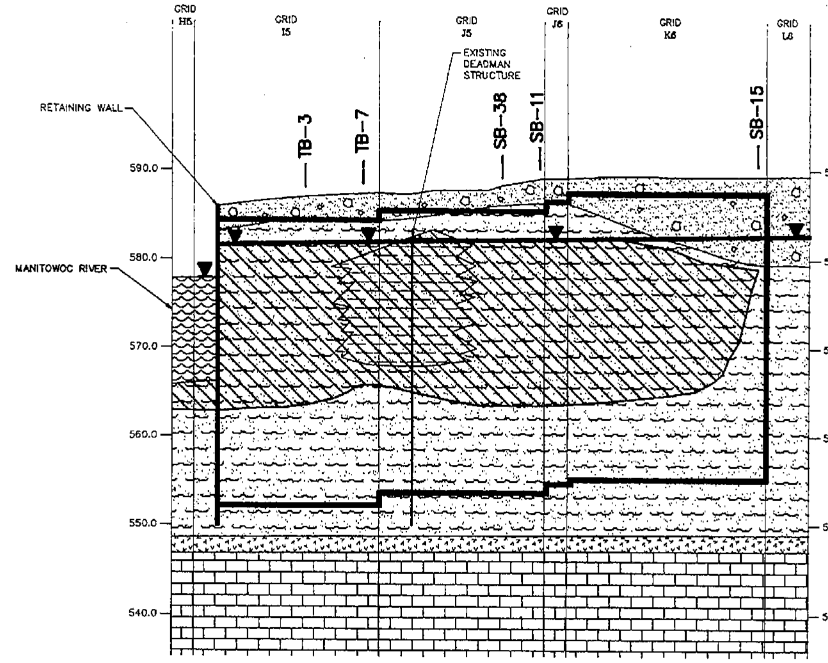
NO.	REVISIONS	BY	DATE
	ISSUED FOR CONSTRUCTION		8/3/93

REVISED IN ACCORDANCE WITH CONSTRUCTION RECORDS

WISCONSIN FUEL & LIGHT COMPANY
MANITOWOC, WISCONSIN
IN SITU SOIL STABILIZATION
REMEDIATION AREA CROSS SECTIONS 1, 2, AND 3

DESIGNED BY	MAL	DATE	MAY, '93
DRAWN BY	VR	DATE	MAY, '93
CHECKED BY	SST	DATE	MAY, '93
FILE	2257403	EDIT	VR060393
SCALE			1:20
DRAWING			1:20
PLOT			
PROJECT	22574		

C3
SHEET NO.



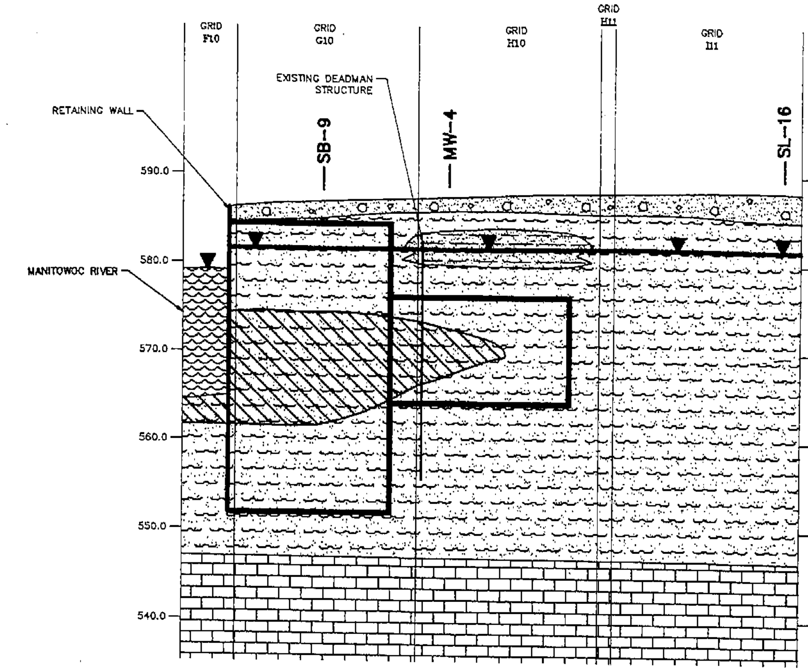
4 C2/C4 CROSS SECTION

LEGEND

- COAL TAR & HEAVILY COAL TAR IMPACTED SOILS
- SAND & GRAVEL
- CLAYEY SAND
- SILTY SAND
- TILL
- BEDROCK
- MANITOWOC RIVER
- APPROXIMATE LOCATION OF WATER TABLE
- REMEDIATION BOUNDARY

NOTES:
1. RETAINING WALL ANCHOR SYSTEM NOT SHOWN IN CROSS SECTIONS. REFER TO REFERENCE DRAWINGS S2 AND S2 FOR LOCATION AND DEPTH.
2. REFER TO DRAWING C1 FOR GRID LOCATIONS.

HORIZONTAL SCALE – 1" = 10'
VERTICAL SCALE – 1" = 10'



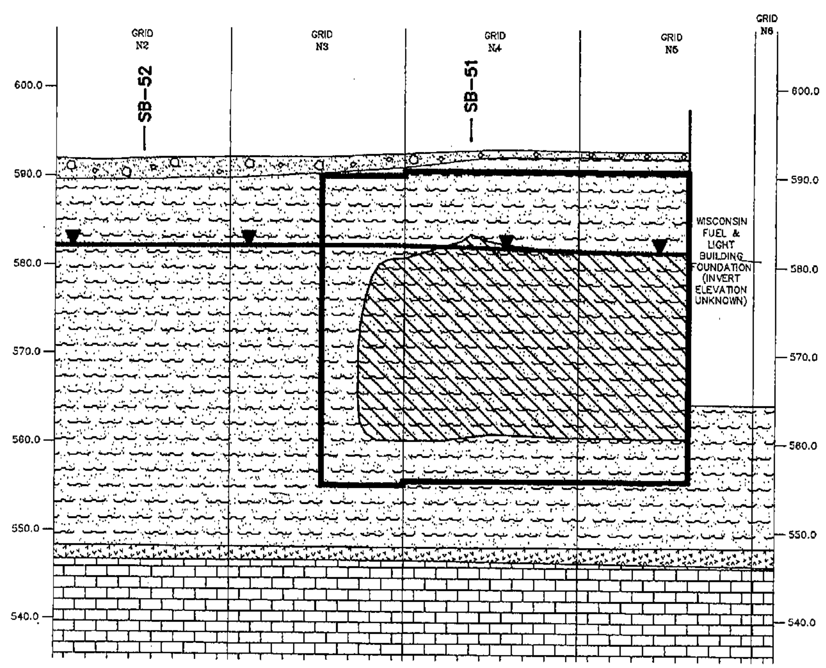
5 C2/C4 CROSS SECTION

LEGEND

- COAL TAR & HEAVILY COAL TAR IMPACTED SOILS
- SAND & GRAVEL
- CLAYEY SAND
- SILTY SAND
- BEDROCK
- MANITOWOC RIVER
- APPROXIMATE LOCATION OF WATER TABLE
- REMEDIATION BOUNDARY

NOTES:
1. RETAINING WALL ANCHOR SYSTEM NOT SHOWN IN CROSS SECTIONS. REFER TO REFERENCE DRAWINGS S2 AND S2 FOR LOCATION AND DEPTH.
2. REFER TO DRAWING C1 FOR GRID LOCATIONS.

HORIZONTAL SCALE – 1" = 10'
VERTICAL SCALE – 1" = 10'



6 C2/C4 CROSS SECTION

LEGEND

- COAL TAR & HEAVILY COAL TAR IMPACTED SOILS
- SAND & GRAVEL
- SILTY SAND
- TILL
- BEDROCK
- APPROXIMATE LOCATION OF WATER TABLE
- REMEDIATION BOUNDARY

NOTES:
1. RETAINING WALL ANCHOR SYSTEM NOT SHOWN IN CROSS SECTIONS. REFER TO REFERENCE DRAWINGS S2 AND S2 FOR LOCATION AND DEPTH.
2. REFER TO DRAWING C1 FOR GRID LOCATIONS.

HORIZONTAL SCALE – 1" = 10'
VERTICAL SCALE – 1" = 10'

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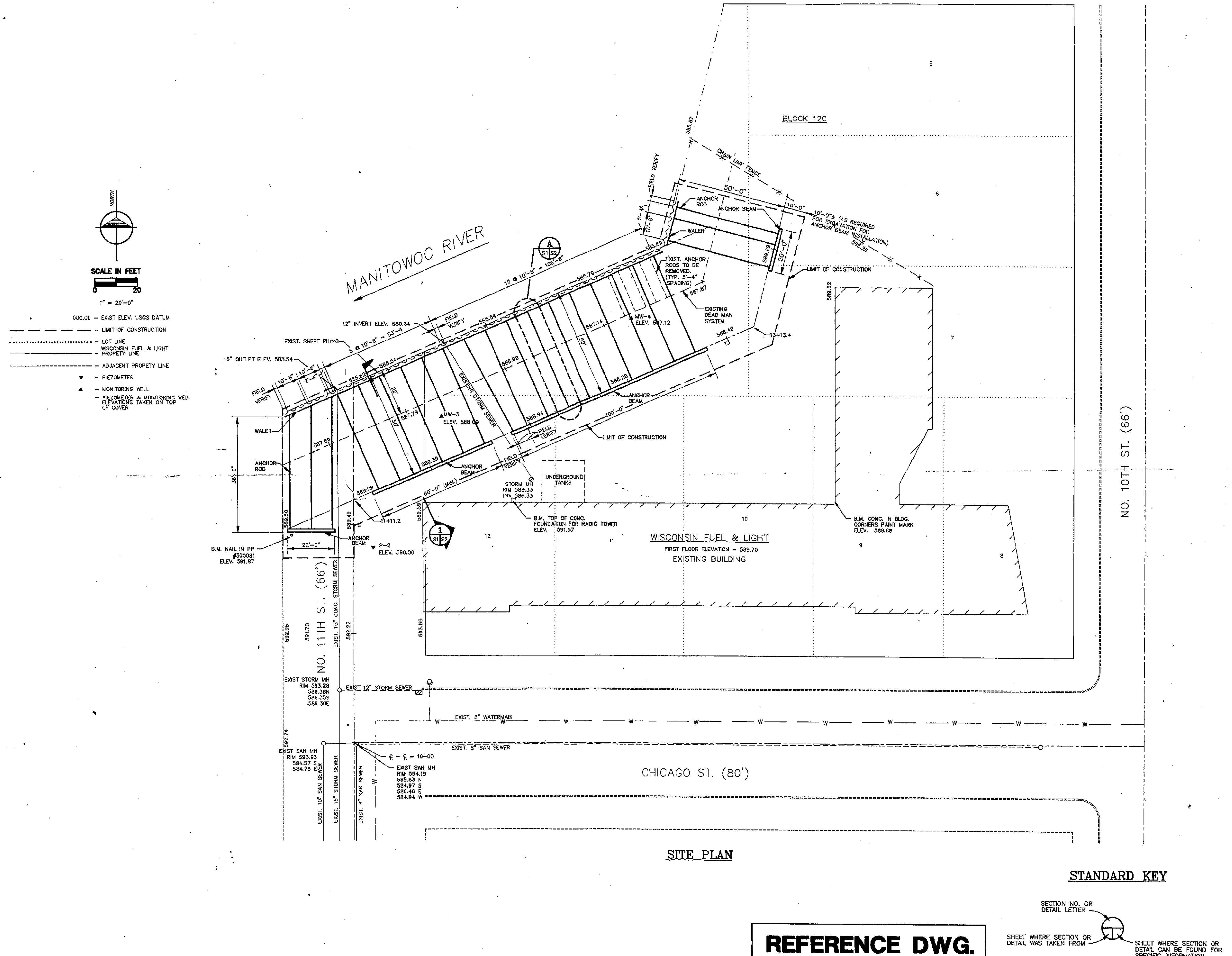
NO.	REVISIONS	BY	DATE	NO.	REVISIONS	BY	DATE
	ISSUED FOR CONSTRUCTION		6/3/93				

REVISED IN ACCORDANCE WITH CONSTRUCTION RECORDS BY DATE

WISCONSIN FUEL & LIGHT COMPANY
MANITOWOC, WISCONSIN
IN SITU SOIL STABILIZATION
REMEDIATION AREA CROSS SECTIONS 4, 5, AND 6

DESIGNED BY	MAL	DATE	MAY, '93
DRAWN BY	VR	DATE	MAY, '93
CHECKED BY	SST	DATE	MAY, '93
FILE	22574C4	EDIT	VR060393
SCALE			1:10
DRAWING			1:10
PLOT			
PROJECT	22574		

C4
SHEET NO.



REFERENCE DWG.

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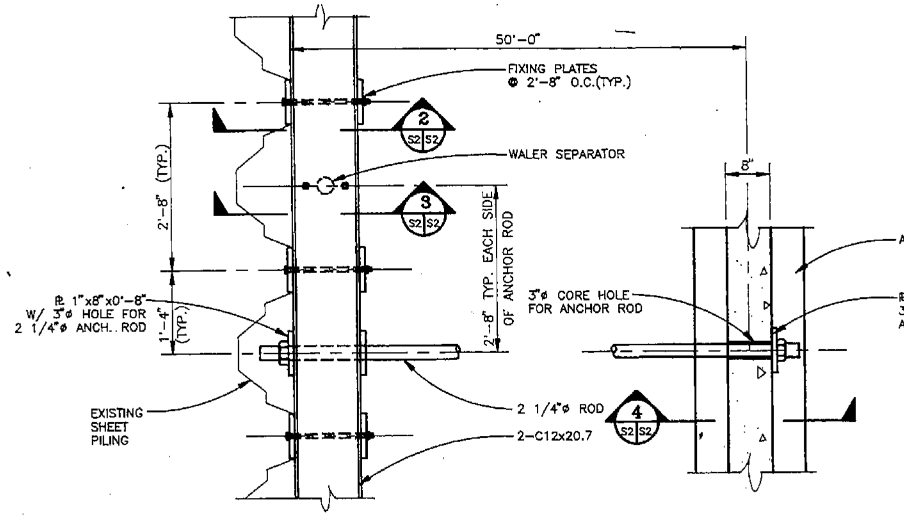
NO.	REVISIONS	BY	DATE
	ISSUED FOR BIDS		5/7 1993

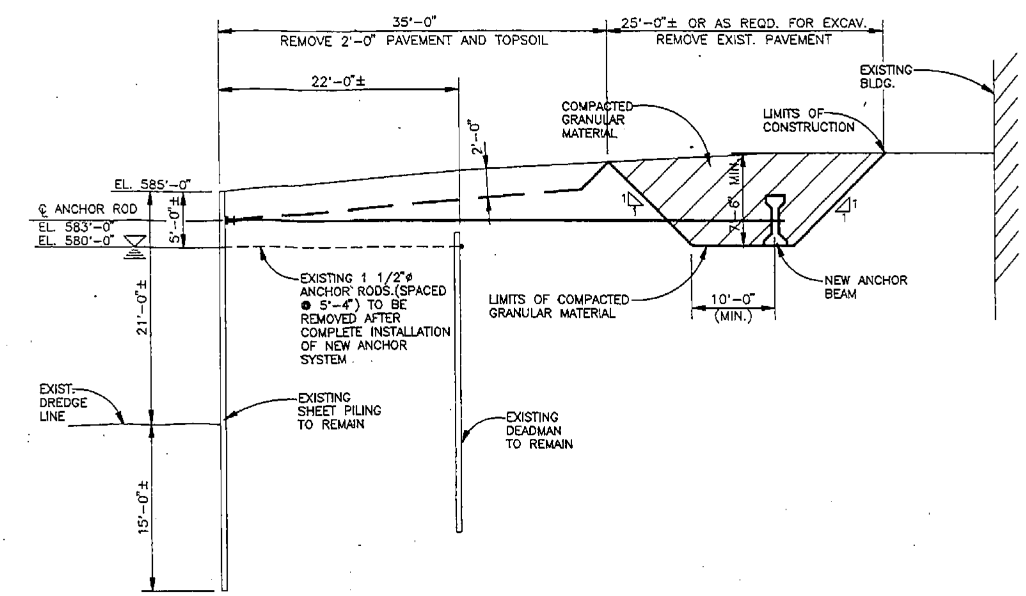
REVISED IN ACCORDANCE WITH CONSTRUCTION RECORDS — BY — DATE

WISCONSIN FUEL & LIGHT COMPANY
MANITOWOC, WISCONSIN
CIVIL \ STRUCTURAL FOR IN SITU SOIL STABILIZATION
RETAINING WALL ANCHOR SYSTEM – SITE PLAN

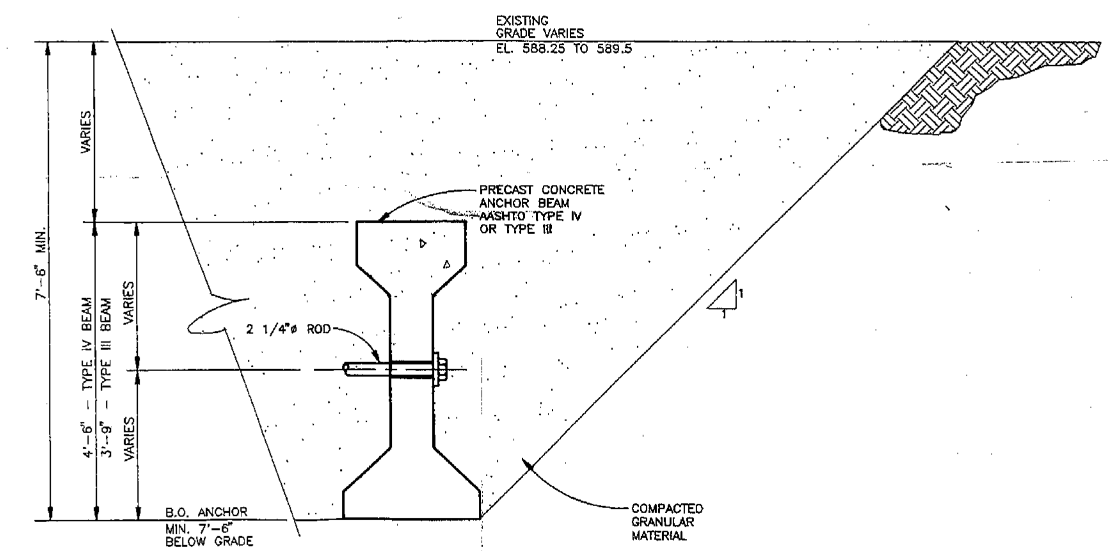
DESIGNED BY M.W.B.	DATE APR. '93
DRAWN BY R.J.S.	DATE APR. '93
CHECKED BY D.J.E.	DATE MAY. '93
FILE 63599S1	EDIT CTB060393
SCALE 1" = 20'-0"	DRAWING 1:1
	PLOT
PROJECT	63599
SHEET NO.	S1



A ENLARGED PLAN
SCALE: 3/4" = 1'-0"

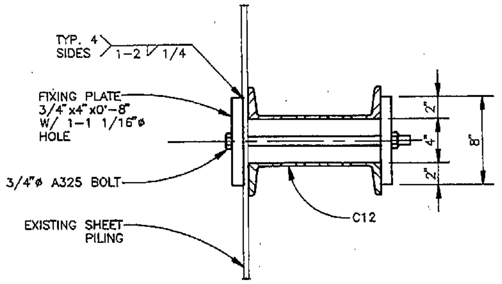


1 SECTION
SCALE: 1/8" = 1'-0"

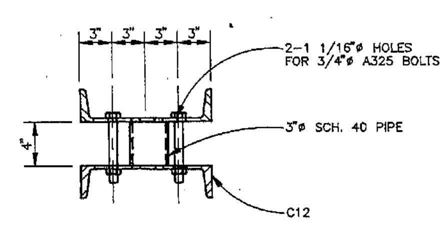


NOTE: BOTTOM OF ANCHOR BEAM TO BE INSTALLED A MINIMUM OF 7'-6" BELOW GRADE. ANCHOR BEAM SHALL BE INSTALLED AT CONSTANT ELEVATION.

4 SECTION
SCALE: 3/4" = 1'-0"



2 SECTION
SCALE: 1 1/2" = 1'-0"



3 SECTION
SCALE: 1 1/2" = 1'-0"

NOTES:

GENERAL:

1. ELEVATIONS AND DIMENSIONS OF EXISTING STRUCTURES AND PLANT UTILITIES HAVE BEEN BASED ON THE BEST INFORMATION AVAILABLE AT THE TIME OF DESIGN AND MUST BE VERIFIED IN THE FIELD BY THE CONTRACTOR. THE CONTRACTOR WILL BE RESPONSIBLE TO VERIFY ALL DIMENSIONS AND ELEVATIONS BEFORE PROCEEDING WITH ANY WORK. IMMEDIATELY NOTIFY THE CONSTRUCTION MANAGER OF ANY CONFLICTS WHICH WILL EFFECT THE PROGRESS OF THE WORK.

EXCAVATION:

1. BEFORE STARTING EXCAVATION, ESTABLISH LOCATION AND EXTENT OF UNDERGROUND UTILITIES OCCURRING IN WORK AREA.
2. PROVIDE DRY EXCAVATIONS UNTIL STRUCTURES HAVE BEEN PLACED AND FILL IS COMPLETE.
3. BACKFILL: ALL EXCAVATIONS SHALL BE BACKFILLED WITH EXISTING MATERIAL OR MATERIAL MEETING THE GRADATION REQUIREMENTS OF ASTM STANDARD D-1241 TYPE I GRADE B MATERIAL. ALL FILL SHALL BE COMPACTED IN 9 INCH LIFTS TO 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED IN ACCORDANCE WITH ASTM STANDARD D-698 (STANDARD PROCTOR).
4. SURPLUS EXCAVATED OR UNSUITABLE MATERIAL SHALL BE STOCKPILED AS DIRECTED BY THE OWNER OR CONSTRUCTION MANAGER.
5. MAINTAIN EXISTING UTILITY SERVICES, INCLUDING STORM SEWERS WHICH PASS THROUGH AREA OF WORK.
6. TESTING OF BACKFILL AND OTHER TESTING REQUIRED WILL BE BY A CONSULTANT SELECTED BY, AND AS DIRECTED BY THE CONSTRUCTION MANAGER.

STRUCTURAL STEEL

1. WALES, ANCHOR RODS AND PLATES SHALL BE: ASTM A36, HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A123 OR THEY SHALL BE ASTM A588 GRADE 50 (WEATHERING STEEL)
2. BOLTS AND NUTS: ASTM A307 (UNLESS NOTED)
3. TURNBUCKLES: ASTM A235
4. WELDING MATERIALS: TYPE REQUIRED FOR THE MATERIALS BEING WELDED AND CONFORMING TO THE APPLICABLE AWS (AMERICAN WELDING SOCIETY) SPECIFICATIONS.

ANCHOR BEAMS

1. PRECAST CONCRETE ANCHOR BEAMS SHALL HAVE STANDARD AASHTO TYPE IV OR TYPE III DIMENSIONS.
2. LENGTH OF ANCHOR BEAMS SHOWN ON PLANS ARE MINIMUM LENGTHS. BEAMS DO NOT HAVE TO BE CONTINUOUS. (I.E. 100'-0" LENGTH SHOWN ON PLAN CAN BE A 40'-0" AND A 60'-0" BEAM.)

CONSTRUCTION SEQUENCE

1. INSTALL SILT FENCING / SILT CURTAINS AND ADSORBENT BOOMS PER SPECIFICATIONS.
2. REMOVE THE EXISTING PAVEMENT WITHIN THE LIMITS OF CONSTRUCTION AS REQUIRED FOR THE EXCAVATION FOR INSTALLATION OF THE NEW RETAINING WALL ANCHOR SYSTEM.
3. REMOVE TWO FEET OF TOP SOIL EXTENDING THIRTY FIVE FEET FROM THE EXISTING RETAINING WALL (SEE SECTION ONE SHEET S2). STOCK PILE THIS MATERIAL ON SITE AS DIRECTED BY THE OWNER OR THE CONSTRUCTION MANGER.
4. LOCATE AND DOCUMENT EXISTING ANCHORAGE SYSTEM INCLUDING DEADMAN AND ANCHOR RODS.
5. VERIFY THE LOCATION OF THE EXISTING STORM SEWERS. STORM SEWERS SHALL BE MAINTAINED IN SERVICE DURING AND AFTER INSTALLATION OF THE NEW ANCHOR SYSTEM.
6. INSTALL NEW WALER, CONCRETE ANCHOR BEAMS AND ANCHOR RODS.
7. BACKFILL AND COMPACT NEW CONCRETE ANCHOR BEAMS.
8. REMOVE THE EXISTING ANCHOR RODS. EXCAVATION REQUIRED FOR THE REMOVAL OF THE ANCHOR RODS SHALL BE MINIMIZED.

NOTE: THE TWO FOOT DEEP EXCAVATION EXTENDING THIRTY-FIVE FEET FROM THE RETAINING WALL SHALL REMAIN EXCAVATED AND DOES NOT HAVE TO BE BACKFILLED UNDER THIS CONTRACT.

REFERENCE DWG.

WW Engineering & Science
A Summit Company
5555 Glenwood Hills Parkway, SE • P.O. Box 874 • Grand Rapids, MI 49588-0874 • (616) 942-9600

NO.	REVISIONS	BY	DATE
	ISSUED FOR BIDS		5/7 1993

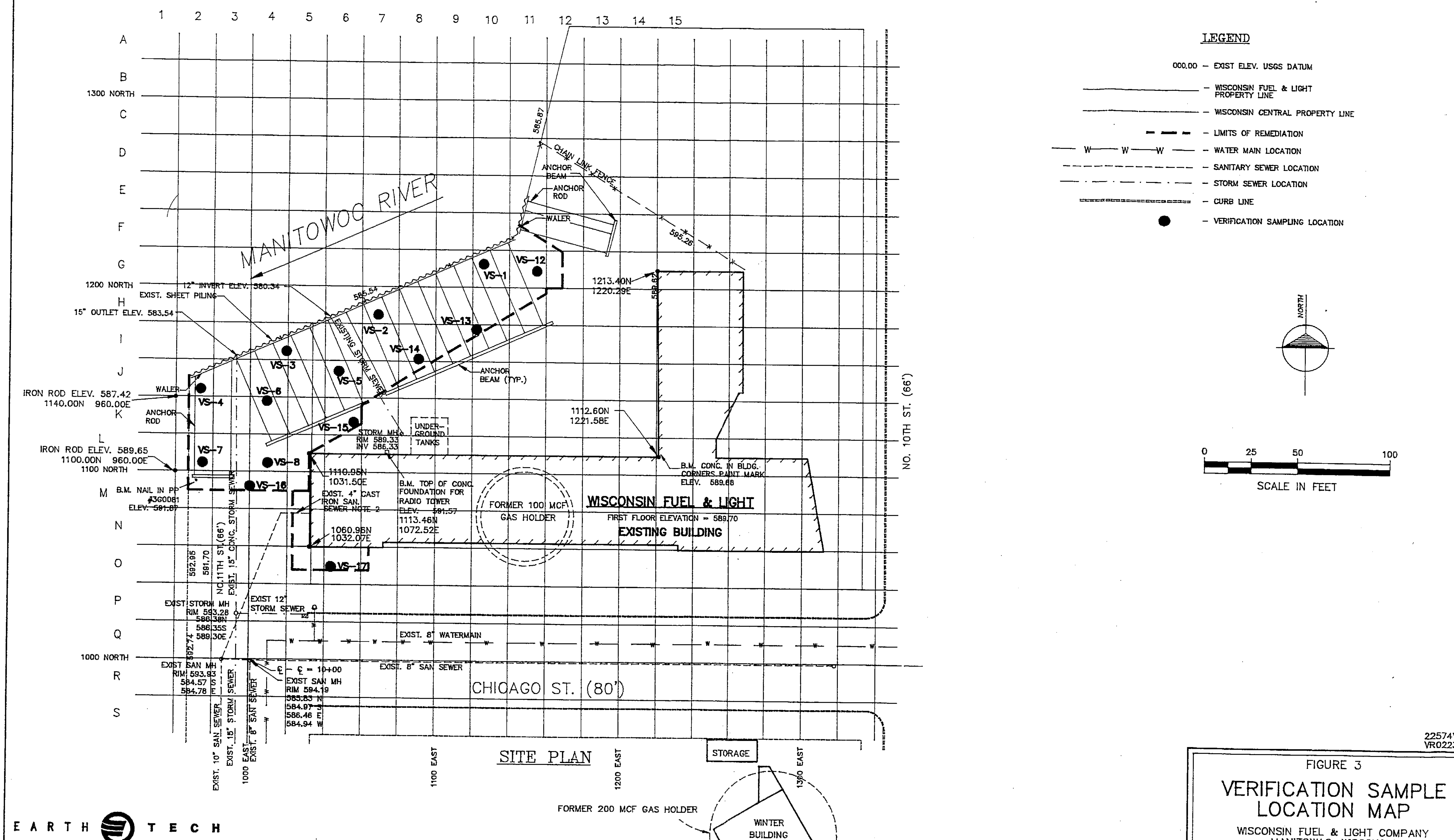
REVISED IN ACCORDANCE WITH CONSTRUCTION RECORDS — BY — DATE

WISCONSIN FUEL & LIGHT COMPANY
MANITOWOC, WISCONSIN
CIVIL \ STRUCTURAL FOR IN SITU SOIL STABILIZATION
RETAINING WALL ANCHOR SYSTEM – SECTION AND DETAILS

DESIGNED BY M.W.B.	DATE APR. '93
DRAWN BY R.J.S.	DATE APR. '93
CHECKED BY D.J.E.	DATE MAY. '93
FILE 63599S2	EDIT CTB060393
SCALE AS NOTED	DRAWING 1:16
PROJECT 63599	PLOT
SHEET NO. S2	

APPENDIX D

ISS VERIFICATION SAMPLE LOCATIONS



EARTH TECH

22574VS2
VR022395

FIGURE 3

VERIFICATION SAMPLE LOCATION MAP

WISCONSIN FUEL & LIGHT COMPANY
MANITOWAC, WISCONSIN

FEBRUARY, 1995

22574

APPENDIX E

SITE RECONNAISSANCE FIELD NOTES, OBSERVATIONS AND PHOTO LOG (JANUARY 5, 2007)

CHECKLIST FOR ECOLOGICAL ASSESSMENT/SAMPLING

I. SITE DESCRIPTION

1. Site Name: Manitowoc MGP Site

   Location: 402 North Tenth Street

   County: Manitowoc City: Manitowoc State: WI

2. ~~Latitude:~~ T19N, R24E, Section 19 Longitude: ______

3. What is the approximate area of the site? upland portion area estimated to be 2.5 acres, river portion unknown

4. Is this the first site visit? ☒ yes ☐ no. If no, attach trip report of previous site visit(s), if available. Expponents first trip

   Date(s) of previous site visit(s): ______

5. Please attach to the checklist USGS topographic map(s) of the site, if available.

6. Are aerial or other site photographs available? ☒ yes ☐ no. If yes, please attach any available photo(s) to the site map at the conclusion of this section.

7. The land use on the site is:

   ____ % Urban
   ____ % Rural
   ____ % Residential Commercial
   100 % Industrial (☒ light ☐ heavy)
   ____ % Agricultural
   (*Crops*: ______)
   ____ % Recreational
   (*Describe; note if it is a park, etc.*)
   ______
   ____ % Undisturbed
   ____ % Other

   The area surrounding the site is: ≈ 0.5 mile radius

   ____ % Urban
   ____ % Rural
   25 % Residential
   75 % Industrial (☒ light ☒ heavy)
   ____ % Agricultural
   (*Crops*: ______)
   ____ % Recreational
   (*Describe; note if it is a park, etc.*)
   ______
   ____ % Undisturbed
   ____ % Other

1/5/07

8. Has any movement of soil taken place at the site? ☐ yes ☒ no. If yes, please identify the most likely cause of this disturbance:

_______ Agricultural Use _______ Heavy Equipment _______ Mining

_______ Natural Events _______ Erosion _______ Other

Please describe: None observed during site visit. The upland portion of the site is covered with pavement and buildings. Only a small amount of grassy area in front of the buildings.

9. Do any potentially sensitive environmental areas exist adjacent to or in proximity to the site, e.g., Federal and State parks, National and State monuments, wetlands, prairie potholes? *Remember, flood plains and wetlands are not always obvious; do not answer "no" without confirming information.*

No wetlands observed; Manitowoc River is adjacent to property, but constrained within sheet pile walls and wood pile walls.

Please provide the source(s) of information used to identify these sensitive areas, and indicate their general location on the site map.

Site observations

10. What type of facility is located at the site?

☐ Chemical ☒ Manufacturing ☐ Mixing ☐ Waste disposal

☒ Other (specify) Commercial, food service and WPSC vehicle storage, parking lot, storage buildings, office building, lumber yard

11. What are the suspected contaminants of concern at the site? If known, what are the maximum concentration levels? PAHs, VOCs, cyanide, metals, phenols, see completion report for maximum concentrations

12. Check any potential routes of off-site migration of contaminants observed at the site:

☐ Swales ☐ Depressions ☐ Drainage ditches

☐ Runoff ☐ Windblown particulates ☐ Vehicular traffic

☒ Other (specify) Sheen seen on water & River by facility. This has been monitored overtime (see completion report)

13. If known, what is the approximate depth to the water table? —

1/5/07

14. Is the direction of surface runoff apparent from site observations? ☒ yes ☐ no. If yes, to which of the following does the surface runoff discharge: Indicate all that apply.

☒ Surface water ☐ Groundwater ☒ Sewer ☐ Collection impoundment

↳ Rear parking lot drains to River ↳ Front of building drains to Sewer

15. Is there a navigable waterbody or tributary to a navigable waterbody? ☐ yes ☐ no.

Manitowoc River

16. Is there a waterbody anywhere on or in the vicinity of the site? If yes, also complete Section III: Aquatic Habitat Checklist - Non-Flowing Systems and/or Section IV: Aquatic Habitat Checklist - Flowing Systems.

☒ yes (approx. distance directly adjacent) ☐ no

17. Is there evidence of flooding? ☐ yes ☒ no. *Wetlands and flood plains are not always obvious; do not answer "no" without confirming information.* If yes, complete Section V: Wetland Habitat Checklist. The waterbody is constrained within floodwalls, but the FEMA Floodplain map indicates a portion of the property is within the 100yr floodplain

18. If a field guide was used to aid any of the identifications, please provide a reference. Also, estimate the time spent identifying fauna. (Use a blank sheet if additional space is needed for text.)

Spent approximately 1 hr picking invertebrates from sand/gravel material collected from River. Trees along edges of river look primarily like cottonwood or other early successional species, some dogwood too.

19. Are any threatened and/or endangered species (plant or animal) known to inhabit the area of the site? ☒ yes ☐ no. *If yes, you are required to verify this information with the U.S. Fish and Wildlife Service.* If species' identities are known, please list them next.

~~[illegible]~~ Report from WPSC based on information from the WDNR indicates that an endangered fish species was reported within Manitowoc River (historic record)

20. Record weather conditions at the time this checklist was prepared:

DATE: 1-05-07

≐45°	Temperature (°C/°F)	20's	Normal daily high temperature
light NW	Wind (direction/speed)	NONE	Precipitation (rain, snow)
Mostly cloudy	Cloud cover		

Note this will be confirmed with a follow up request to WDNR and USFWS.

1/5/07

IA. SUMMARY OF OBSERVATIONS AND SITE SETTING

Walked the site from ≈ 9:15Am to 10:30, then collected benthic invertebrates with a D-net from ≈ 10:30 - 11:30. Note see attached map for location of video, pictures, and benthic invertebrate collection.

This site does not afford any upland terrestrial habitat for wildlife. The upland portion of the site is covered with buildings and a parking lot. Banks along the river are lined with a steel sheet pile wall. Banks along the river are away from the sheet pile wall is lined with wood pilings. off-property along the river the banks are steep with a narrow area of trees growing on a steep bank.

Across the river from the property is a heavy industrial complex. The remainder of the area surrounding the property is either light industrial / commercial or residential.

Benthic invertebrates were collected from a shallow area near the end of the sheet pile wall. The sides of the wood piles were probed with a D-net and gravel / detritus was collected from bottom and picked. Numerous zebra mussels shells; Gammarus/asellus sowbugs mostly

Completed by Michael Kienske Affiliation Exponent

Additional Preparers

Site Manager

Date 1/5/07

predominant, also 3 fingerling fish were collected which were preserved in methanol. Split sample with NRT.

1/5/07

II. TERRESTRIAL HABITAT CHECKLIST

IIA. WOODED

1. Are there any wooded areas at the site? ☐ yes ☒ no. If no, go to Section IIB: Shrub/Scrub.

2. What percentage or area of the site is wooded? (______ % ______ acres). Indicate the wooded area on the site map which is attached to a copy of this checklist. Please identify what information was used to determine the wooded area of the site.

3. What is the dominant type of vegetation in the wooded area? (Circle one: Evergreen/Deciduous/Mixed) Provide a photograph, if available.

   Dominant plant, if known: ______________________________

4. What is the predominant size of the trees at the site? Use diameter at breast height.

   ☐ 0-6 in. ☐ 6-12 in. ☐ >12 in.

5. Specify type of understory present, if known. Provide a photograph, if available.

IIB. SHRUB/SCRUB

1. Is shrub/scrub vegetation present at the site? ☐ yes ☒ no. If no, go to Section IIC: Open Field.

2. What percentage of the site is covered by scrub/shrub vegetation? (______ % ________ acres). Indicate the areas of shrub/scrub on the site map. Please identify what information was used to determine this area.

3. What is the dominant type of scrub/shrub vegetation, if known? Provide a photograph, if available.

4. What is the approximate average height of the scrub/shrub vegetation?

   ☐ 0-2 ft. ☐ 2-5 ft. ☐ >5 ft.

5. Based on site observations, how dense is the scrub/shrub vegetation?

   ☐ Dense ☐ Patchy ☐ Sparse

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IIC. OPEN FIELD

1. Are there open (bare, barren) field areas present at the site? ☐ yes ☒ no. If yes, please indicate the type below:

   ☐ Prairie/plains ☐ Savannah ☐ Old field ☐ Other (specify) ____________________

2. What percentage of the site is open field? (______ % ______ acres). Indicate the open field on the site map.

3. What is/are the dominant plant(s)? Provide a photograph, if available.

4. What is the approximate average height of the dominant plant? ______________________________

5. Describe the vegetation cover: ☐ Dense ☐ Sparse ☐ Patchy

IID. MISCELLANEOUS

1. Are other types of terrestrial habitats present at the site, other than woods, scrub/shrub, and open field? ☐ yes ☒ no. If yes, identify and describe them below.

   Upland portion of site is covered with building, parking area; with only small areas of ornamental grass lawn.

2. Describe the terrestrial miscellaneous habitat(s) and identify these area(s) on the site map.

3. What observations, if any, were made at the site regarding the presence and/or absence of insects, fish, birds, mammals, etc.?

4. Review the questions in Section I to determine if any additional habitat checklists should be completed for this site.

1/05/07

III. AQUATIC HABITAT CHECKLIST – NON-FLOWING SYSTEMS

Note: Aquatic systems are often associated with wetland habitats. Please refer to Section V, Wetland Habitat Checklist.

1. What type of open-water, non-flowing system is present at the site? None

   ☐ Natural (pond, lake)

   ☐ Artificially created (lagoon, reservoir, canal, impoundment)

2. If known, what is the name(s) of the waterbody(ies) on or adjacent to the site?

   ____

3. If a waterbody is present, what are its known uses (e.g.: recreation, navigation, etc.)?

4. What is the approximate size of the waterbody(ies)? ____________________ acre(s).

5. Is any aquatic vegetation present? ☐ yes ☐ no. If yes, please identify the type of vegetation present is known.

   ☐ Emergent ☐ Submergent ☐ Floating

6. If known, what is the dept of the water? NA ____________________

7. What is the general composition of the substrate? Check all that apply.

   ☐ Bedrock ☐ Sand (coarse) ☐ Muck (fine/black)

   ☐ Boulder (> 10 in.) ☐ Silt (fine) ☐ Debris

   ☐ Cobble (2.5-10 in.) ☐ Marl (shells) ☐ Detritus

   ☐ Gravel (0.1-2.5 in.) ☐ Clay (slick) ☐ Concrete

   ☐ Other (specify) ____________________

8. What is the source of water in the waterbody?

   ☐ River/Stream/Creek ☐ Groundwater ☐ Other (specify)__________

   ☐ Industrial discharge ☐ Surface runoff

9. Is there a discharge from the site to the waterbody? ☐ yes ☐ no. If yes, please describe this discharge and its path.

1/05/07

10. Is there a discharge from the waterbody? ☐ yes ☐ no. If yes, and the information is available, identify from the list below the environment into which the waterbody discharges.

☐ River/Steam/Creek	☐ On-site	☐ Off-site	Distance ______
☐ Groundwater	☐ On-site	☐ Off-site	
☐ Wetlands	☐ On-site	☐ Off-site	Distance ______
☐ Impoundment	☐ On-site	☐ Off-site	

11. Identify any field measurements and observations of water quality that were made. For those parameters for which data were collected provide the measurement and the units of measure below:

_______ Area

_______ Depth (average)

_______ Temperature (depth of the water at which the reading was taken) ______

_______ pH

_______ Dissolved oxygen

_______ Salinity

_______ Turbidity (clear, slightly turbid, turbid, opaque) (Secchi disk depth ______, visual)

_______ Other (specify)

NA

12. Describe observed color and area of coloration.

13. Mark the open-water, non-flowing system on the site map attached to his checklist.

14. What observations, if any, were made at the waterbody regarding the presence and/or absence of benthic macroinvertebrates, fish, birds, mammals, etc.?

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IV. AQUATIC HABITAT CHECKLIST – FLOWING SYSTEMS

Note: Aquatic systems are often associated with wetland habitats. Please refer to Section 4, Wetland Habitat Checklists.

1. What type(s) of flowing water system(s) is (are) present at the site?

- [x] River
- [ ] Stream
- [ ] Creek
- [ ] Dry wash
- [ ] Arroyo
- [ ] Brook
- [ ] Artificially created (ditch, etc.)
- [ ] Intermittent Stream
- [ ] Channeling
- [ ] Other (specify) ______

2. If known, what is the name of the waterbody? Manitowoc River

3. For natural systems, are there any indicators of physical alteration (e.g., channeling, debris, etc.)?

[x] yes [ ] no. If yes, please describe indicators that were observed.
Area is a turning basin constrained within sheet pile walls and steep sloping banks.

4. What is the general composition of the substrate? Check all that apply.

- [ ] Bedrock
- [ ] Sand (coarse)
- [ ] Muck (fine/black)
- [ ] Boulder (> 10 in.)
- [ ] Silt (fine)
- [ ] Debris
- [ ] Cobble (2.5-10 in.)
- [ ] Marl (shells)
- [ ] Detritus
- [x] Gravel (0.1-2.5 in.)
- [ ] Clay (slick)
- [ ] Concrete
- [ ] Other (specify) ______

Note this is observation at location where benthic invertebrate were sampled (see completion report for more details)

5. What is the condition of the bank (e.g., height, slope, extent of vegetation cover)?
Sheet pile wall on property; rock boulder walls and wood piling line adjacent off-property shoreline.

6. Is the system influenced by tides? [ ] yes [x] no. What information was used to make this determination?

7. Is the flow intermittent? [ ] yes [x] no. If yes, please note the information that was used in making this determination.

1/5/07

8. Is there a discharge from the site to the waterbody? ☐ yes ☒ no. If yes, please describe the discharge and its path. None noticed, soil adjacent to River were previously solidified (see completion report).

9. Is there a discharge from the waterbody? ☒ yes ☐ no. If yes, and the information is available, please identify what the waterbody discharges to and whether the discharge is on-site or off-site.

Lake Michigan; off-site

10. Identify any field measurement sand observations of water quality that were made. For those parameters for which data were collected, provide the measurement and the units of measure in the appropriate space below:

_______ Width (ft) NA

_______ Depth (ft)

_______ Velocity (specify units): _______________

_______ Temperature (depth of the water at which the reading was taken _______________)

_______ pH

_______ Dissolved oxygen

_______ Salinity

_______ Turbidity (clear, slightly turbid, turbid, opaque) (Secchi disk depth _______________)

_______ Other (specify) _______________

11. Describe observed color and area of coloration.

slightly turbid brown water

12. Is any aquatic vegetation present? ☐ yes ☒ no. If yes, please identify the type of vegetation present, if known.

☐ Emergent ☐ Submergent ☐ Floating

13. Mark the flowing water system on the attached site map.

See attached map

14. What observations were made at the waterbody regarding the presence and/or absence of benthic macroinvertebrates, fish, birds, mammals, etc.?

Collected benthic invertebrates at one location accessible along edge of floodwall. Observed geese, seagulls using area of the the river near property during site walk, most song birds have already migrated, but little habitat in area for birds

1/25/07

V. WETLAND HABITAT CHECKLIST

1. Based on observations and/or available information, are designated or known wetlands definitely present at the site?

   ☐ yes ☒ no

   Please note the sources of observations and information used (e.g., USGS Topographic Maps, National Wetland Inventory, Federal or State Agency, etc.) to make this determination.

   Field observations

2. Based on the location of the site (e.g., along a waterbody, in a floodplain) and site conditions (e.g., standing water, dark, wet soils; mud cracks; debris line; water marks), are wetland habitats suspected? ☐ yes ☒ no. If yes, proceed with the remainder of the wetland habitat identification checklist.

3. What type(s) of vegetation are present in the wetland?

   ☐ Submergent ☐ Emergent

   ☐ Scrub/Shrub ☐ Wooded

   ☐ Other (specify) ______________________

   NA

4. Provide a general description of the vegetation present in and around the wetland (height, color, etc.). Provide a photograph of the known or suspected wetlands, if available.

5. Is standing water present? ☐ yes ☐ no. If yes, is this water: ☐ fresh ☐ brackish. What is the approximate area of the water (sq. ft.) ______________. Please complete questions 4, 11, 12 in Checklist III – Aquatic Habitat – Non-Flowing Systems.

6. Is there evidence of flooding at the site? What observations were noted?

   ☐ Buttressing ☐ Water marks ☐ Mud cracks

   ☐ Debris line ☐ Other (describe below)

7. If known, what is the source of the water in the wetland?

   ☐ Steam/River/Creek/Lake/Pond ☐ Groundwater

   ☐ Flooding ☐ Surface Runoff

8. Is there a discharge from the site to a known or suspected wetland? ☐ yes ☐ no. If yes, please describe.

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9. Is there a discharge from the wetland? ☐ yes ☐ no. If yes, to what waterbody is discharge released?

☐ Surface Stream/River ☐ Groundwater ☐ Lake/Pond ☐ Marine

10. If a soil sample was collected, describe the appearance of the soil in the wetland area. Circle or write in the best response.

Color (blue/gray, brown, black, mottled) NA

Water content (dry, wet, saturated/unsaturated) ____________

11. Mark the observed wetland area(s) ion the attached site map.

N:\Jobs\forms\wprocess\48_Master checklist eco assess.doc

End of Form

MWK

1/5/07

Diagram of Photo Locations

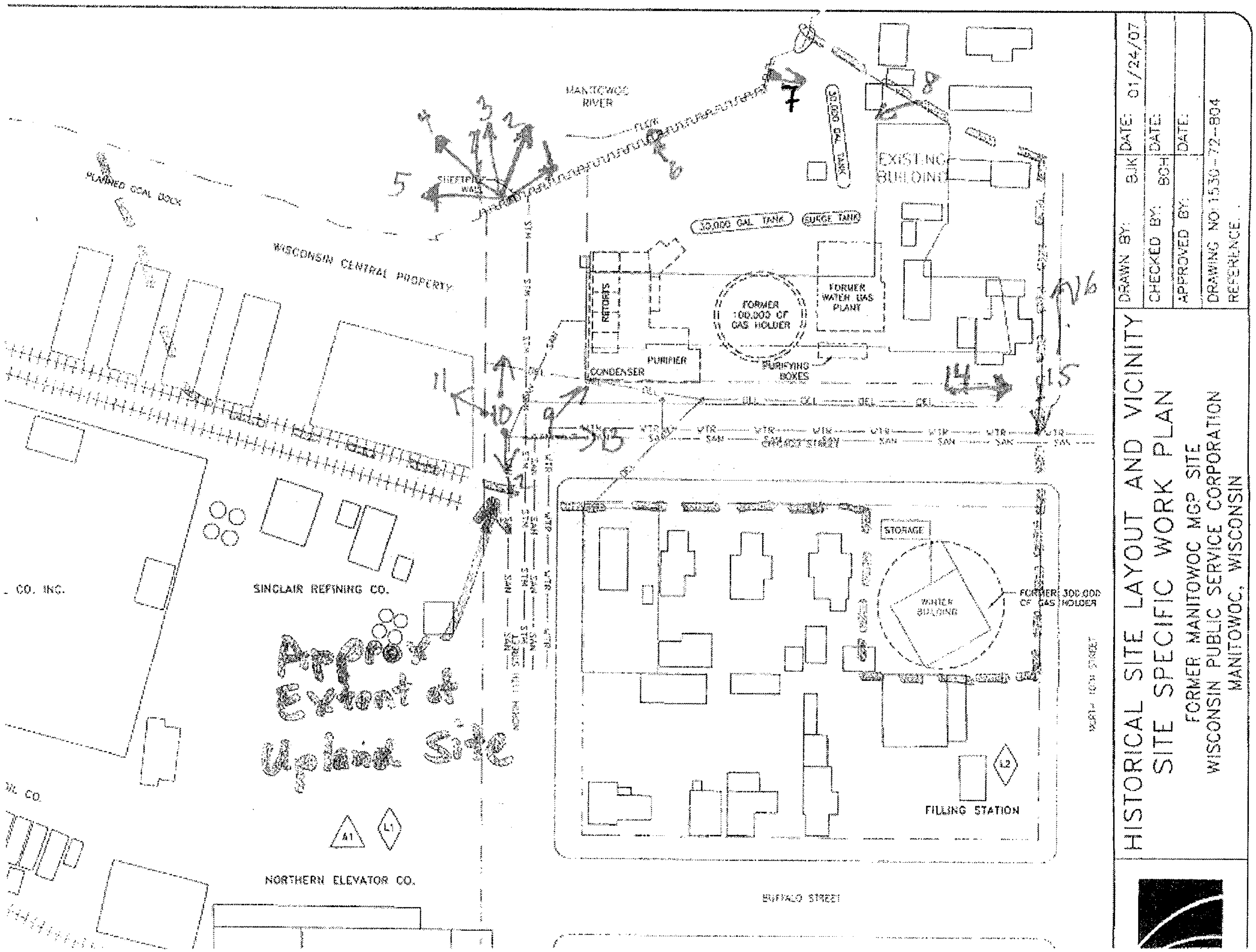


Photo 1
Looking northeast from the west end of the sheet pile wall near the termination of North 11th Street and the Manitowoc River.

Photo 2
Looking north-northeast from the west end of the sheet pile wall near the termination of North 11th Street in the upstream direction of the Manitowoc River.

Photo 3
Looking north from the west end of the sheet pile wall near the termination of North 11th Street across the Manitowoc River to the industrial complex on the opposite side of the river.

Photo 4
Looking north-northwest from the west end of the sheet pile wall near the termination of North 11th Street across the Manitowoc River to the far end of the industrial complex on the opposite side of the river.

Photo 5
Looking west from the west end of the sheet pile wall near the termination of North 11th Street downstream along the Manitowoc River; the south shore of the river adjacent to the Wisconsin Central Property is shown.

Photo 6
Example of Notice signs posted on the rail of the sheet pile wall on the property.

Photo 7
Looking east up the steep slope on the property showing the east edge of the parking lot and the north end of the WPSC building.

Photo 8
Looking to the west-southwest across the parking lot from atop the step slope on the east end of the property. North side of the WPSC building is shown.

Photo 9
Looking at the southwest corner of the WPSC building from near the corner of North 11th Street and Chicago Street. NRT employee is standing in the approximate location of monitoring well MW14, which is located approximately 30 feet from the building.

Photo 10
Looking north from the corner of North 11th Street and Chicago Street. Note how the road and adjacent parking lot slope toward the river.

Photo 11
Looking approximately west toward the Wisconsin Central Railroad and Braun Building properties from the corner of North 11th Street and Chicago Street.

Photo 12
Looking south toward the garage building (Kitzerow Enterprises) from the corner of North 11th Street and Chicago Street.

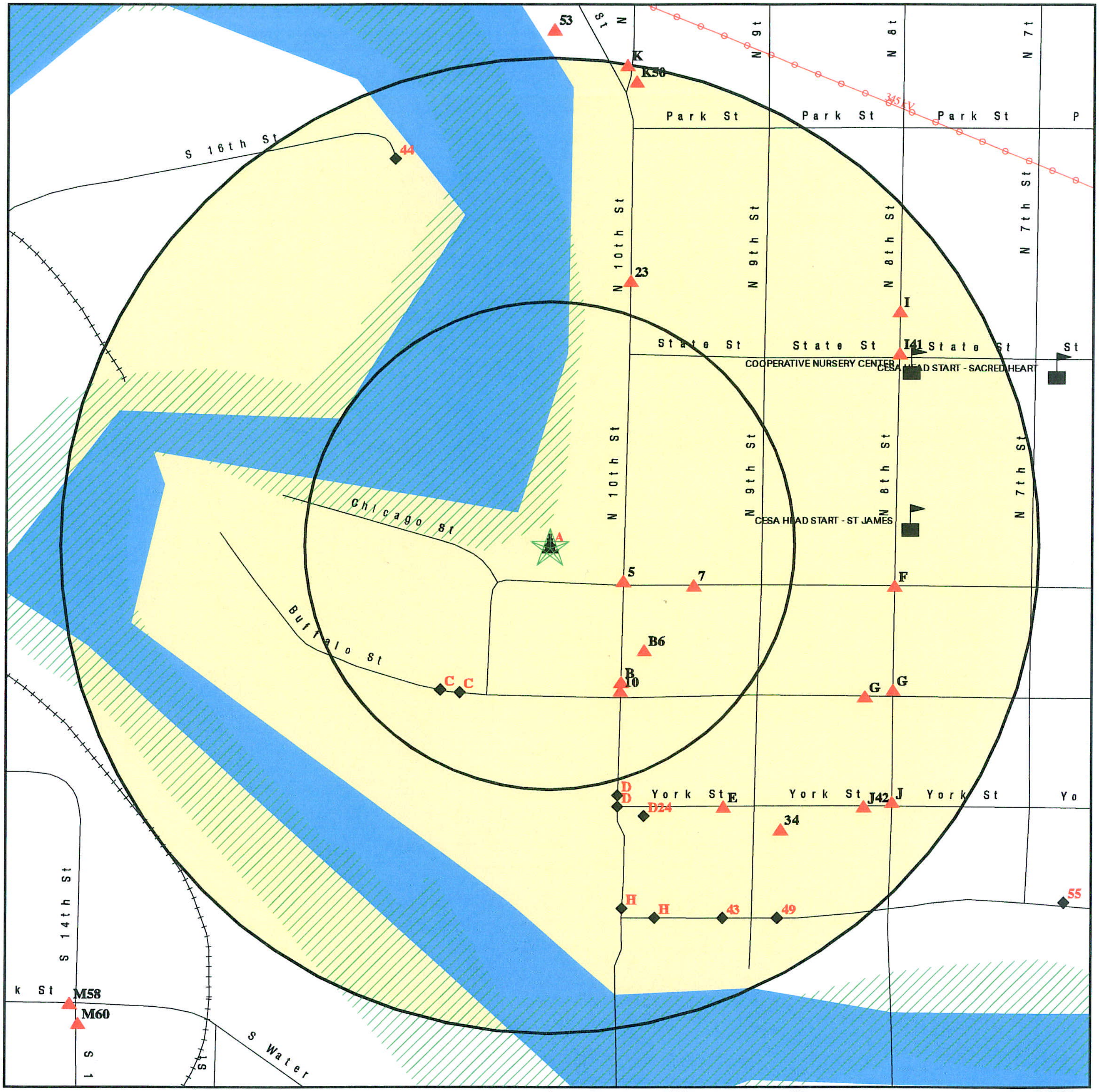
Photo 13
Looking east along Chicago Street from the corner of North 11th Street and Chicago Street. Note the lawn area located on the south side of the WPSC building (left) and the WPSC-owned storage building and Winter building (right).

Photo 14
Looking east from the southeast corner of the WPSC Building across North 10th Street toward the commercial development on the opposite side of the street.

Photo 15
Looking south from the corner of North 10th Street and Chicago Street toward the Winter building (middle) and WPSC storage building (right).

Photo 16
Looking north from the corner of North 10th Street and Chicago Street which shows the residential development further down North 10th Street.

DETAIL MAP - 1831689.2s



0 1/16 1/8 1/4 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Former Wisconsin Fuel and Light	CLIENT:	Natural Resource Technology
ADDRESS:	North 11th Street/Chicago Street Manitowoc WI 54220	CONTACT:	Brian Hennings
		INQUIRY #:	1831689.2s
LAT/LONG:	44.0957 / 87.6613	DATE:	January 10, 2007 11:43 am

WISCONSIN WETLANDS' INVENTORY

DNR Bureau of Water Regulation and Zor

LEGEND

Class → E1Ka ← Hydrologic Modifier
Subclass → E1Ka ← Special Modifier

Class and subclass

A Aquatic bed
- 1 Submergent
- 2 Floating
  - 3 Rooted floating
  - 4 Free floating

M Moss

E Emergent/wet meadow
- 1 Persistent
  - 2 Narrow-leaved persistent
  - 3 Broad-leaved persistent
- 4 Nonpersistent
  - 5 Narrow-leaved nonpersistent
  - 6 Broad-leaved nonpersistent

S Scrub/shrub
- 1 Deciduous
  - 2 Needle-leaved deciduous
  - 3 Broad-leaved deciduous
- 4 Evergreen
  - 5 Needle-leaved evergreen
  - 6 Broad-leaved evergreen
- 7 Dead
- 8 Needle-leaved
- 9 Broad-leaved

T Forested
- 1 Deciduous
  - 2 Needle-leaved deciduous
  - 3 Broad-leaved deciduous
- 5 Needle-leaved evergreen
- 7 Dead
- 8 Needle-leaved

F Flats/unvegetated wet soil
- Ø Subclass unknown
- 1 Cobble/gravel
- 2 Sand
- 3 Mud
- 4 Organic
- 5 Vegetated pioneer

W Open water
- Ø Subclass unknown
- 1 Cobble/gravel
- 2 Sand
- 3 Mud
- 4 Organic

Hydrologic modifier

- L Standing water, Lake
- R Flowing water, River
- H Standing water, Palustrine
- K Wet soil, Palustrine

Special modifiers

- a Abandoned cropland
- c Man-made cranberry bog
- e Exposed flats complex
- f Farmed in dry years
- g Grazed
- j Central sands complex
- m Floating vegetated mats
- s Ridge and swale complex
- v Vegetation recently removed
- w Floodplain complex
- x Excavated
- r Red clay complex

Map symbols

- U Upland surrounded by wetland
- ——— Wetland — upland boundary
- – – – Wetland — deep water lake

APPENDIX F

SITE-SPECIFIC MODIFICATIONS TO MULTI-SITE DOCUMENTS

APPENDIX F1

SITE-SPECIFIC QUALITY ASSURANCE PROJECT PLAN

F1 QUALITY ASSURANCE PROJECT PLAN

This appendix provides site-specific elements as identified in the Multi-Site Quality Assurance Project Plan (QAPP). Unless specifically noted otherwise, the Multi-Site QAPP will be followed while implementing the Site-Specific Work Plan (SSWP) at the Manitowoc Former MGP. This appendix references the Multi-Site QAPP sections which may require site-specific elements.

Section 1.1 – Introduction

The Multi-Site QAPP addresses all of the activities to be performed at the Manitowoc Former MGP.

Section 1.3 – Problem Definition/Background Information (A5)

Soil vapor, related to vapor intrusion into buildings, may be considered a media of potential concern for buildings on the Site. Recommendations on whether soil vapor sampling is warranted is discussed in Section 6.5.

Section 1.4 – Project/Task Description and Schedule (A6)

Refinement of the Data Quality Objectives (DQOs) presented in the Multi-Site QAPP are presented in Section 5.4 of the SSWP. Geophysical investigations to assess limits of waste, etc. are not proposed in the SSWP. The other activities described in Section 1.4 of the Final QAPP will be performed.

Site-specific tasks to be performed and the sampling rationale are presented in Section 6 of the SSWP.

The project quantitation limits (PQLs) presented in the Multi-Site QAPP will be used for the Manitowoc SSWP. There are no additional analytical sampling parameters required. The laboratories (mobile and fixed) to be used for soil, soil vapor, sediment, and water analyses will be identified prior to initiating RI field work. A site-specific sampling and analysis summary is presented on Table 4 of the SSWP and details the media to be sampled and the constituents to be analyzed.

A site-specific schedule for implementing the remedial investigation/feasibility study (RI/FS) activities is presented in Figure 16 and discussed in Section 9 of the SSWP.

Modifications to the Generalized Conceptual Site Model (CSM) and the Multi-Site Risk Assessment Framework (RAF) are discussed in Appendix F3.

Section 1.5.3 – Step 3 Decision Inputs

As mentioned above, Table 4 summarizes the media to be sampled and the constituents to be analyzed. The PQLs presented in the Multi-Site QAPP will be used for the Manitowoc SSWP. The PQLs will be sufficiently low to compare with the screening levels presented in the Multi-Site RAF. In some instances, the PQL may be above the screening level because commercially available techniques cannot achieve detection levels below the screening levels. Section 6 of the SSWP describes the sampling devices to be used in accordance with the Multi-Site Field Sampling Plan (FSP). Modifications to the FSP are included in Appendix F4.

Section 1.5.3.1 – Screening Level Ecological Risk Assessment (SLERA)

Guidance documents to be used to evaluate ecological risk are described in the Multi-Site RAF.

Section 1.5.3.2 – Human Health Risk Assessment (HHRA)

Guidance documents to be used to evaluate human health risks are described in the Multi-Site RAF.

Section 1.5.4 – Step 4 Investigation Boundaries

Figure 3 of the SSWP depicts the site boundaries, zoning and ownership. Figure 13 presents the proposed soil sampling locations, Figure 14 presents the proposed soil vapor sampling locations, and Figure 15 presents the proposed groundwater monitoring well and piezometer locations. Sheets 2 and 3 provide proposed surface water and sediment sampling locations.

Sample volumes required for laboratory and toxicity testing are provided on Table 4 of the SSWP.

As mentioned above, the sampling rationale is presented in Section 6 of the SSWP.

Section 1.5.8 Measurement Performance Criteria

As discussed in Section 6 of the SSWP, the laboratories selected to perform the analysis will be provided to USEPA for review and approval in accordance with the AOC/SOW.

Section 2.1.1 Schedule

A site-specific schedule for implementing the remedial investigation/feasibility study (RI/FS) activities is presented in Figure 16 and discussed in Section 9 of the SSWP.

Section 2.1.2 Sampling Design Rationale

Table 4 summarizes the media to be sampled and the constituents to be analyzed.

Section 2.3.1.3 Sample Container, Volume, Preservation and Holding Time

Table 4 summarizes the sample containers, volume, preservation and holding times for the media to be sampled and the constituents to be analyzed.

Section 2.4 Analytical Methods Requirements (B4)

Table 4 summarizes the parameters to be analyzed.

APPENDIX F2

SITE-SPECIFIC HEALTH AND SAFETY PLAN

DRAFT

HEALTH AND SAFETY PLAN

WISCONSIN PUBLIC SERVICE CORPORATION
FORMER MANUFACTURED GAS PLANT SITE
MANITOWOC, WISCONSIN

Prepared for:

Wisconsin Public Service Corporation
700 North Adams Street
Green Bay, Wisconsin 54307

Prepared by:

Natural Resource Technology, Inc.
23713 W. Paul Road, Suite D
Pewaukee, WI 53072

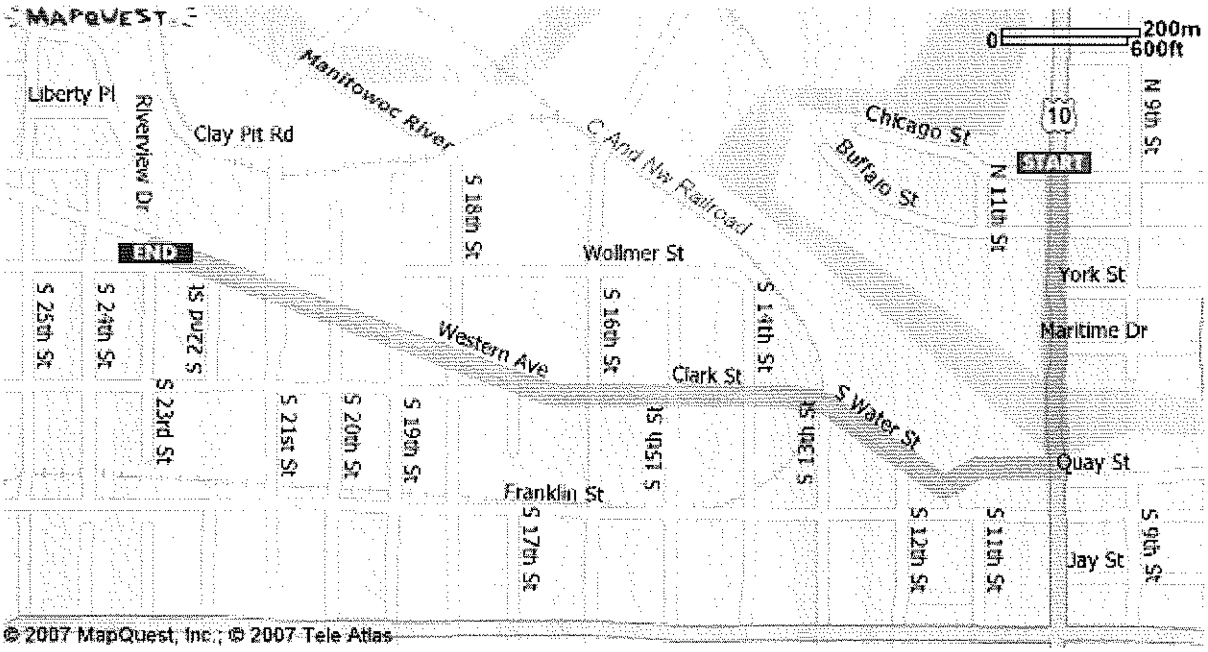
April 10, 2008

Project No: 1530

NATURAL RESOURCE TECHNOLOGY
MULTI-SITE HEALTH AND SAFETY PLAN SUMMARY

Prior to initiating site-specific field activities, the following information will be provided to USEPA and to each field staff member within the Site-Specific Work Plan. A copy of this Health and Safety Plan (HASP) will be maintained on site during field activities and updated as determined necessary by the Project Manager.

Site Address: 402 N. 10th Street, Manitowoc, WI
Major Cross Roads: Chicago Street and 10th Street
Hospital Address: 2300 Western Avenue
Direction to Hospital from Site (see map below):
1: Start out going SOUTH on N 10TH ST / US-10 E / CR-B S toward CHICAGO ST.. 0.2 miles
2: 2: Turn RIGHT. 0.1 miles
3: Turn RIGHT onto S WATER ST. 0.1 miles
4: S WATER ST becomes CLARK ST. 0.2 miles
5: Turn SLIGHT RIGHT onto WESTERN AVE. 0.3 miles
6: End at Holy Family Memorial Med Ctr: 2300 Western Ave, Manitowoc, WI 54220, US
Total Est. Time: 4 minutes **Total Est. Distance:** 1.16 miles



Activity(s) and Dates of Work: Sediment assessment and sampling, groundwater and surface water sampling, groundwater monitoring well and soil boring installation, and soil and soil vapor sampling. Schedule presented in Figure 16 of the Site-Specific Work Plan.

Description of Site (See map Figure 2 in Work Plan): Approximately 2.5 acres, currently owned by WPSC, City of Manitowoc (property and street right-of-ways), Wisconsin Central Railroad, and Winter.

Potential Health/Safety Hazards on Site:

Chemical	Media	Maximum Concentration (Water)	Maximum Concentration (Soil)	Maximum Concentration (Sediment)	Routes of Exposure
Volatile Organic Compounds	Water, Soil, Sediment	330 µg/L benzene	32 mg/kg benzene (17'bgs)	112,000 mg/kg total BTEX (0-2')	Inhalation, ingestion, skin or eye contact
Semi-Volatile Organic Compounds	Water, Soil, Sediment	783 µg/L total PAHs	3,200 mg/kg naphthalene (13' bgs)	10,890 mg/kg total PAHs (0-2')	Inhalation, ingestion, skin or eye contact
Metals	Water, Soil, Sediment	0.005 mg/L arsenic (1992)	3.0 mg/kg arsenic (7' bgs), 490 mg/kg lead (7')	516 mg/kg lead (4-6')	Inhalation, ingestion, skin or eye contact
Cyanide	Water, Soil, Sediment	0.02 mg/L (2004)	15 mg/kg (15' bgs)	23 mg/kg (0-2')	Inhalation, ingestion, skin or eye contact
Others based on Site-Specific conditions	n/a	n/a	n/a	n/a	n/a

The safety coordinator/emergency coordinator will be the NRT staff personnel supervising the field investigation/work.

Protective Equipment/Instruments:

In general, personal protective equipment (PPE) will be used as specified on Table 1 for the anticipated project tasks. The project manager may require additional PPE based on field conditions or additional data collection. A list of the PPE required for the various site activities is listed on Table 1.

Air Monitoring:

In general, a PID (and possibly a CGM) will be used to monitor air quality in the work zone and breathing zone during subsurface site investigation activities. Tasks requiring use of either the PID or CGM are listed in Table 1. Use of the PID will be continuous during test pit excavation and sampling, and sporadically during soil boring sampling.

Actions levels for the PID are listed below and discussed in more detail in Section 7.3 of the Multi-Site HASP. The VOC action levels include the following:

- Occurs when a reading of 50 ppm is sustained on PID when it is held at a constant height either in the excavation or the breathing zone. (Sustained readings last more than 30 seconds and the meter either continues to climb or remains relatively stable. Wildly fluctuating readings require a calibration check).

- Sustained readings of 50 ppm require use of either full-face or half-face respirators utilizing Organic Vapor cartridge filters.

- Air quality monitoring continues to ensure that PID readings do not exceed sustained readings of 500 ppm.

- If the 500-ppm action level is achieved, all activities on the site will immediately stop. The NRT PM will be contacted prior to taking any further action on the site.

Safety Equipment:

Fire extinguisher and first aid kit in NRT field vehicles

EMERGENCY CONTACT LIST

Emergency contact phone numbers will be provided in the Site-Specific Work Plan. The emergency numbers will be confirmed prior to initiating field activities.

Client Contact:	Brian Bartoszek	920-433-2643
Fire Dept:	Manitowoc Fire Department	920-683-4520
Police:	Manitowoc Police Department	920-683-4500
Sheriff:	Manitowoc County Sheriff	920-683-4200
Local Utility	Manitowoc Public Utilities	920-683-4600
Local Water Co.	Manitowoc Public Utilities	920-683-4600
NRT:	Julie Zimdars	262-523-9000
Ambulance or Emerge. Med.	911	911
Contractors:		
Hospital:	Holy Family Memorial Med Center	920-320-2011

Field Staff Emergency Contact

Table 1. Summary of PPE By Sampling Activities

PPE Required	Site Reconnaissance/Field Mobilization	Drilling (monitoring wells/bore holes)	Monitoring Well Development and Conductivity Testing	Groundwater Levels and Sampling	Soil Sampling (heavy equipment or drill rig)	Soil Sampling (hand augers or shovels)	Surface Water Sampling (from land or shallow wading)	Surface Water Sampling (water craft)	Sediment Sampling (shallow wading)	Sediment Sampling (water craft)	Subsurface structure sampling (from surface)
Steel-Toed Boots (Rubber)		Av	Av	Av	Av	Av	Av	Av	Av	Av	Av
Steel-Toed Boots (Leather)	X	X	X	X	X	X	X	X	Av	X	X
Hard Hat		X			X					X	X
Safety Glasses/Goggles	X	X	X	X	X	X	X	X	X	X	X
Gloves-Inner (Nitrile)	Av	X	X	X	X	X	X	X	X	X	Av
Gloves-Outer (Nitrile)		X	X	X	X	X	X	X	X	X	
Orange Vest	X	X	X	X	X	X	X	X	X	X	X
Life Vest							X	X	X	X	
Tyvek Coverall		Av			Av	Av			Av	Av	
Half-Face Respirator					Av	Av					
Respirator Cartridge (Hepa or Org. Vapor)					X	X					
Photoionization Detector (PID)		Av			Av	Av					X
Combustible Gas Meter (CGM)											X
Other											

Key:
X = PPE Required
Av = Have available at work site
Glove types may be altered based on field conditions to include Vinyl, Neoprene, and/or Latex
"Other" required or to be available PPE will be identified for each task in the Site-Specific Work Plan.

FIELD HEALTH & SAFETY BRIEFING

NRT Project # 1530 NRT Task # ______

I HEREBY CERTIFY THAT I HAVE READ AND UNDERSTOOD ALL HEALTH AND SAFETY PROCEDURES AS STATED HEREIN:

Name and Affiliation (printed)	Signature	Date

H & S plan was received from subcontracting company.

☐ YES ☐ NO ☐ Not Applicable

H & S training documentation was received from subcontracting company

☐ YES ☐ NO ☐ Not Applicable

This page should be copied after it has been signed and put into the project file.

APPENDIX F3

SITE-SPECIFIC CONCEPTUAL SITE MODEL AND RISK ASSESSMENT FRAMEWORK

F3 SITE-SPECIFIC CONCEPTUAL SITE MODEL AND RISK ASSESSMENT FRAMEWORK

This appendix provides a summary of supplemental methods, approaches, media, receptors (human or ecological) and/or exposure pathways that may be necessary to evaluate the Manitowoc Former MGP Site and were not included in the Final Generalized Conceptual Site Model (CSM) and Final Multi-Site Risk Assessment Framework (RAF). A general Baseline Risk Assessment Report outline is presented in the RAF.

1.1 Additional Potential Receptors and Media Identified in Site Reconnaissance

Soil vapor, related to vapor intrusion into buildings, may be considered a media of potential concern for buildings on the Site. The human health risk assessment methods for this potential exposure pathway are described below.

1.2 Supplemental Human Health Risk Assessment Methods

1.2.1 Data Evaluation Process for Vapor Intrusion Assessments

1.2.1.1 Introduction

The purpose of this document is to provide a general framework for evaluating the data obtained during vapor intrusion assessments. Vapor intrusion assessments will generally include the evaluation of data from multiple media, potentially including soil, groundwater, soil gas, sub-slab soil gas, and/or indoor air. Data from each medium will be evaluated individually for validity and usability, as well as in combination with data from other media in order to consider multiple lines of evidence in determining whether vapor intrusion poses potential human health risks. The evaluation process conceptually follows the tiered approach presented in *United States Environmental Protection Agency (USEPA) Office of Solid Waste and Emergency Response (OSWER) Draft Subsurface Vapor Intrusion Guidance (November 2002)* by proceeding from a generic screening assessment to a site-specific pathway assessment if necessary. The most updated published attenuation factors contained *USEPA's Vapor Intrusion Database: Preliminary Evaluation of Attenuation Factors (2008)* will be used for generic screening level calculations.

1.2.1.2 Medium-Specific Evaluation of Analytical Data

Data from different media are appropriate to use for different purposes. For example, most regulatory agencies consider soil data to be inappropriate for evaluating potential exposure due to vapor intrusion; however, soil data can be very useful to identify locations for groundwater and/or soil gas sampling. Each environmental medium also has similar benefits and limitations. The following paragraphs discuss the appropriate uses of data from each medium and provide a general description of how the data will be evaluated.

Soil

Limited empirical data are available establishing attenuation factors from soil to indoor air, and modeling vapor intrusion from soil can be unreliable due to the heterogeneous nature of the medium. As a result of these data limitations, evaluating vapor intrusion from soil may be less reliable than evaluating vapor intrusion from other media, such as soil gas and sub-slab soil gas. In consideration of these limitations, analytical data from soil will primarily be used as means of identifying locations for collecting soil gas samples. Soil gas samples will be collected from areas where soil sampling has indicated the potential for residual source material to be present.

Groundwater

Groundwater data will primarily be used as a means of identifying soil gas and/or sub-slab soil gas sample locations. Additionally, groundwater data will also be used as one line of evidence to establish whether or not vapor intrusion poses potential risk at a site.

The United States Environmental Protection Agency (USEPA) has compiled empirical data on attenuation factors from groundwater to indoor air (USEPA, 2008), and these data can be used to calculate generic screening levels for groundwater. Generic screening levels for groundwater are defined as risk-based screening levels protective of indoor air exposures that are calculated using published attenuation factors from groundwater to indoor air. These screening levels are intended to be used in comparison to analytical data from groundwater as a conservative initial evaluation tool. Since generic attenuation factors are available for groundwater, generic screening levels can be calculated (See Section 1.2.1.3). Groundwater data from a site will be compared to generic screening levels to identify areas where soil gas sampling is warranted. These areas may overlap those where residual source material was identified during soil sampling; however, depending on the hydrogeology at a specific site, evaluation of groundwater data in comparison to generic groundwater screening levels for the vapor intrusion pathway may indicate additional locations where soil gas sampling would be prudent.

Groundwater data will also be used in conjunction with soil gas and/or sub-slab data to provide evidence of the presence or absence of a migration pathway from the subsurface to indoor air. Evaluating analytical data from groundwater along with soil gas data from multiple depth intervals provides a means of tracking the upward vertical migration of vapor-phase chemicals.

Soil Gas and Sub-Slab Soil Gas

Soil gas and sub-slab soil gas will be the primary media used to evaluate whether the vapor intrusion pathway is complete and has the potential to pose unacceptable risk to human health. Collecting exterior soil gas samples is less intrusive to building occupants, and exterior soil gas is less likely to be influence by the building pressure variations that can cause sub-slab soil gas data to be highly variable. For these reasons, exterior soil gas sampling is the preferred method of vapor intrusion investigation. However, the ultimate decision of whether to collect exterior or sub-slab soil gas samples will be influenced by the location of residual source materials. The location of residual source material, the presence or areas of elevated chemical concentrations in groundwater, and building construction information will be factored into the decision of whether soil gas samples will be collected externally to the building or sub-slab within the building.

The USEPA has compiled empirical data on attenuation factors from soil gas and sub-slab soil gas to indoor air, and these data can be used to calculate generic soil gas and sub-slab soil gas screening levels. Generic screening levels for soil gas and sub-slab soil gas are defined as risk-based screening levels protective of indoor air exposures that are calculated using published attenuation factors from soil gas or sub-slab soil gas to indoor air. These screening levels are intended to be used in comparison to analytical data from soil gas or sub-slab soil gas as a conservative initial evaluation tool. Soil gas and/or sub-slab soil gas data will be compared to generic screening levels to determine whether additional evaluation or mitigation is warranted. If exterior soil gas data exceed generic screening levels, consideration will be given to either calculating site-specific soil gas screening levels or collecting sub-slab soil gas samples. Site-specific soil gas screening levels can be calculated by replacing the published attenuation factor used in the generic calculation with a site-specific attenuation factor derived from vertical soil gas concentration profiles. If sub-slab soil gas data exceed generic sub-slab soil gas screening levels, site-specific sub-slab soil gas screening levels will be calculated using site-specific attenuation factors. If sub-slab soil gas data also exceed site-specific screening levels, consideration will be given to either collecting indoor air samples or taking mitigation measures.

Indoor Air

This vapor intrusion program is designed with the intent of not performing indoor air sampling to the extent feasible. The contaminants of interest at former manufactured gas plant (MGP) sites are also commonly present in household and commercial products, and the likely presence of indoor sources of site-related compounds confounds interpretation of the resulting analytical data. However, should indoor air sampling be warranted, the resulting data will be used in conjunction with soil gas, sub-slab, outdoor (ambient) air, and/or groundwater data to establish the presence or absence of a completed vapor intrusion pathway. If it is concluded that constituents in indoor air are likely present as a result of vapor intrusion, the indoor air data will be used to evaluate potential risks to human health. Risks to human health will either be evaluated by comparing the analytical data to risk-based screening levels for indoor air or through completing a site-specific risk assessment.

1.2.1.3 Risk-Based Screening Levels for Evaluating Vapor Intrusion

There are two types of screening levels that may be used to judge the potential for health risk – levels based on direct exposure to air, and levels that are derived to represent a source medium such as groundwater and soil gas. The first category includes concentration-based values (ug/m^3

of air) that are applicable to indoor air. These values are derived based on the following site-specific considerations:

- Use of the building (residence, school, office space, storage area, etc.)
- Age and behaviors of people associated with the use of the building
- Distinctions in use, as appropriate, between basements, ground floors and upper floors
- Applicable lifetime cancer and sub-chronic or chronic health target levels
- Published values on toxic potency (e.g., reference doses, reference concentrations, and unit risk values)

The second category represents values that may be developed to correspond with measurements of soil gas, soils, or groundwater. This set of values are considered source terms that may lead to a particular indoor air concentration. The second set of values is derived from the applicable indoor air target levels by applying appropriate attenuation factors to represent how concentrations attenuate as vapors move through the vadose zone and pass into the building structure. It is anticipated that standard models and attenuation factors representative of particular soils and building types will be used to calculate soil gas values that could result in the indoor air risk-based levels. Because there are several types of soil gas measurement that might be developed for a site-specific investigation, attenuation factors can vary. For example, the attenuation factor applied to a soil gas measurement taken beneath the slab or a building would differ from that made just above the soil/groundwater interface several feet below the ground surface. Because of the site-specific variables associated with deriving appropriate attenuation factors, each case must be considered separately. However, these types of considerations are the same across sites and can draw from common databases (e.g., USEPA, 2008; ASTM, 2008) and models. When collecting soil gas and sub-slab soil gas samples, fixed gases (i.e., oxygen, carbon dioxide, and methane) will be included in the analytical suite. Data on fixed gases can be used to evaluate the potential for bioattenuation, which can then be used to support site-specific attenuation factors and site-specific screening levels.

1.2.1.4 References

ASTM International, 2008. *ASTM E2600-08 Standard Practice for Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transactions.*

USEPA, 2002, *United States Environmental Protection Agency (USEPA) Office of Solid Waste and Emergency Response (OSWER) Draft Subsurface Vapor Intrusion Guidance, EPA 530-D-02-004.*

USEPA, 2008. *U.S. EPA's Vapor Intrusion Database: Preliminary Evaluation of Attenuation Factors.* Office of Solid Waste, U.S. Environmental Protection Agency, Washington, DC 20460.

1.3 Supplemental Ecological Risk Assessment Methods

There are no additional risk assessment methods (beyond those presented in the CSM and RAF) necessary to evaluate ecological receptors and media to be considered at the Manitowoc Former MGP Site.

APPENDIX F4

SITE-SPECIFIC FIELD SAMPLING PLAN

F4 FIELD SAMPLING PLAN

This appendix provides site-specific elements as identified in the Multi-Site Field Sampling Plan (FSP). Unless specifically noted otherwise, the Multi-Site FSP will be followed while implementing the Site-Specific Work Plan (SSWP) at the Manitowoc Former MGP. This appendix references the Multi-Site FSP sections which may require site-specific elements.

1.1.3 Technical Approach

The approach to determine sample locations, types, frequencies, collection methods, and field analysis is discussed in Section 4 and 6 of the SWPP.

Section 6 of the SSWP describes the process for decision making using site knowledge on a real-time basis to determine additional sample type, location, frequency, and analytes.

Table 4 provides the site-specific Sampling and Analysis Plan, summarizing the media and constituents to be analyzed. Figure 13 presents proposed soil exploration and sampling locations, Figure 14 presents proposed soil vapor sampling locations, and Figure 15 presents proposed groundwater monitoring well and piezometer locations. Sheets 2 and 3 provide proposed surface water and sediment sampling locations. Previously performed sampling locations are provided on Figure 6 (upland) and Sheet 1 (sediment).

1.3.2.1 Project Team

The attached Figure 1 presents the Technical Team Strategy. Subcontracted services will be provided to USEPA for review and approval prior to initiating field work, in accordance with the AOC/SOW.

1.3.3 Communication Strategy

Technical Team titles and flow of communication is presented on Figure 1. Resumes of key team members are provided in Attachment 1.

1.3.4 Decision-Making Processes

The decision-making process for field activities is provided in Section 6 of the SSWP.

1.3.5 Data Exchange

Section 6 describes the data required to make field decisions. As data are generated, analytical data will be provided to USEPA in an electronic format in accordance with the AOC/SOW. Data will provided in the monthly progress reports, submitted on the 15th of each month. As appropriate, data may also be provided in figures and tables for submittal with the progress report or stand alone. The RI Report will be submitted in accordance with the Project Schedule, Figure 16 and Section 9 of the SSWP.

Additional Standard Operating Procedures (SOP)

As described in Section 6.6.2.1, an additional standard operating procedure is included below for field logging of the bedrock for rock quality designation (RQD).

1.1 Rock Quality Designation (RQD)

Rock Quality Designation (RQD) is a means of indicating rock mass properties. RQD is based on a modified core recovery procedure which, in turn, is based indirectly on the number of fractures and the amount of softening or alternation in the rock mass as observed in the rock cores from the borehole. Core recovery is the ratio of the length of core recovered to the length drilled (e.g., no recovery = 0 and full recovery = 100). This procedure is an indicator of the general quality of rock for engineering purposes and provides a numerical value which is more sensitive and consistent than gross percentage core recovery.

1.1.1 Procedure

Sum the total length of core recovered by counting only those pieces of hard and sound core which are 4 inches (10 cm) or greater in length. Divide that sum by the total length that the core barrel was advanced. RQD is presented as a percentage.

Although this procedure is less applicable where core recovery is poor, the results are indicative of poor quality rock. However, it should be noted that poor drilling techniques and equipment can also cause poor recovery. It is for this reason that proper equipment and procedure along with competent supervision of the drilling procedure are imperative.

Rock Quality Designation (RQD)	Description of Rock Quality
0 - 25	very poor
25 - 50	poor
50 - 75	fair
75 - 90	good
90 - 100	excellent

1.1.2 Limitations

1) RQD should not be applied to core less than 2 inches (5.4 cm) in diameter as a false RQD may be obtained because smaller cores can be frequently broken during the coring operation;
2) Care must be taken when removing the core from the core barrel. If a core is broken by handling or during drilling, the fresh broken pieces should be fitted together and counted as one piece; and
3) Some judgment is necessary in the case of thinly bedded sedimentary rock and foliated metamorphic rocks. The method is most suitable for igneous rock, thick-bedded limestone, sandstone, etc. However, this procedure can be applied to shale; although it is necessary to log the cores immediately upon removal from the core barrel before air slaking and cracking can occur.

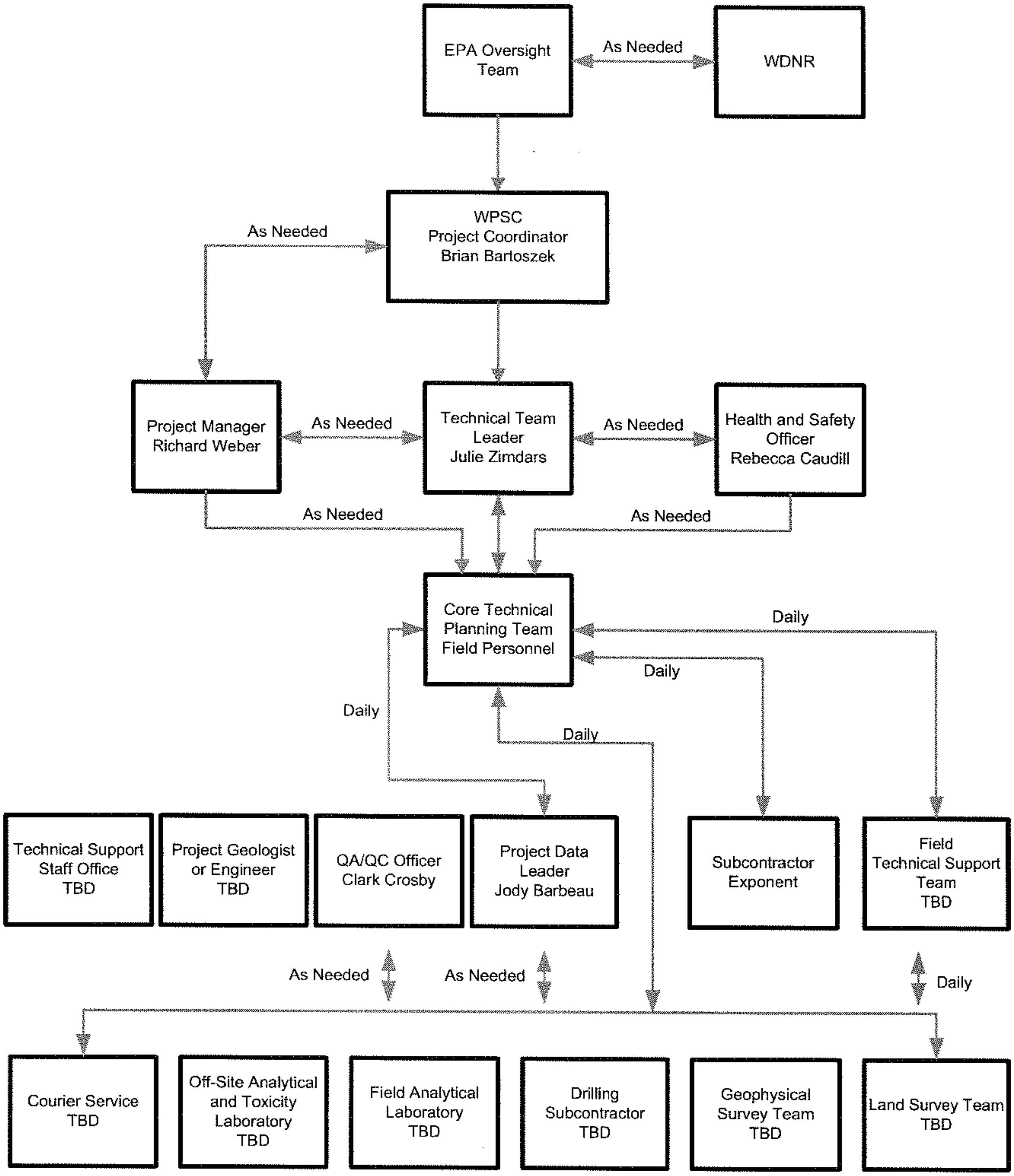
1.2 References

ASTM International, 2003, D5434-03 Guide for Field Logging of Subsurface Explorations of Soil and Rock.

FIGURE 1

TECHNICAL TEAM STRATEGY

FIGURE 1 TECHNICAL TEAM STRATEGY



TBD – To Be Determined

Source: USEPA, 2003, Using Dynamic Field Activities for On-Site Decision Making, OSWER 9200.1-40

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ATTACHMENT 1

KEY TEAM MEMBER RESUMES

NATURAL
RESOURCE
TECHNOLOGY

Professional Profile

Richard H. Weber, PE

Managing Engineer

Summary of Qualifications

Twenty-seven years experience in environmental consulting and geotechnical engineering in the United States and abroad, specializing in client service and management of large projects. Technical expertise includes contaminated sediments, construction management, geotechnical analysis, and solid waste.

Areas of Expertise

- Contaminated sediment remedial investigation/ feasibility study and remedial design/remedial action
- Project management
- Construction management
- Construction quality assurance/ quality control
- Geotechnical engineering
- Slope stability analysis
- Landfill investigation, design and construction
- Peer review
- Probabilistic cost analysis

Education

- M.S., Civil/Geotechnical Engineering, Northwestern University, Illinois, 1981
- B.S., Civil Engineering, UW-Platteville, Wisconsin, 1979

Professional Registrations

- Professional Engineer - #E22938 - WI
- Professional Engineer - #062-047154 - IL
- Professional Engineer - #PE19700348 - IN
- Professional Engineer - #71678 - OH

Representative Project Experience

Contaminated Sediments and Construction Management

Project Manager of multi-disciplined team to work with Wisconsin Department of Natural Resources (WDNR) and the Fox River Group in site characterization, design, permitting, and implementation of the Sediment Management Unit (SMU) 56/57 Demonstration Project in Green Bay, Wisconsin. About 31,000 cubic yard (cy) of soft sediment, contaminated with upwards of 700 mg/kg of polychlorinated biphenyls were hydraulically dredged and disposed for the $12.4 million project budget.

Project Manager for remedial investigations and development of remedial scopes of work to address polychlorinated biphenyl contamination in Pine Creek sediments and overbank soils for the Hayton Area Remediation Project, New Holstein, Wisconsin.

Former Manufactured Gas Plant Sites

Project Manager for remedial investigations/feasibility studies (RI/FS) of sediments affected by former manufactured gas plant (MGP) sites adjacent to the Sheboygan River and Manitowoc River, Wisconsin. Work is being done cooperatively with USEPA Region 5 under CERCLA and Superfund Alternative Site programs. The Triad approach is being used for flexibility and to save time and money, where appropriate. The scope includes risk assessments to evaluate risk to ecological and human receptors, and to facilitate cleanup decisions.

Technical Lead responsible for assessment of environmental remediation cost liability associated with residual contamination in river sediments adjacent to seven former MGP sites in Wisconsin. The assessment required site-by-site review of preliminary investigation results, and an extensive knowledge of regulations, pertinent sediment remedial technologies, and environmental cost estimating principles found in ASTM.

Professional Affiliations

- American Society of Civil Engineers (ASCE)
- Federation of Environmental Technologists (FET), Sediment Subcommittee Chair
- Western Dredging Association (WEDA), Current Board Member

Professional History

- Natural Resource Technology, Inc., (2003-Present), Managing Engineer
- MWH (Predecessor companies of Montgomery Watson and Warzyn Engineering), (1989-2003), Principal Engineer/ Vice President
- Warzyn Engineering, Inc., (1983-1989), Geotechnical Section Manager
- Dames & Moore, (1981-1983), Geotechnical Engineer

Regulatory Committees

- WDNR Bureau of Solid Waste Management Technical Advisory Committee, Revision of Chapter NR 500 per Federal Subtitle D (1990-1994)
- WDNR Contaminated Sediment Advisory Committee (2000-2001)
- WDNR Bureau of Remediation and Redevelopment Brownfields Study Group (2003-2004)
- WDNR Waste Management Program Redesign, Consultant Group (2004)

Remedial Design, Site Closure and Construction Management

Project Manager for demolition/deconstruction of 8-acre brownfield property of former battery manufacturer/packager in Madison, Wisconsin, for redevelopment into commercial and residential uses. 87% of demolition materials were recycled/reused.

Project Manager with complete technical/construction responsibility for $23 million closure of three un-engineered landfills at the former Chanute Air Force Base in Rantoul, Illinois. Closure work at landfills, varying from 12 to 22 acres, included waste consolidation followed by confirmation sampling and analyses, installation of passive gas vent systems and perimeter leachate collection systems, and construction of 5-foot thick composite geosynthetic/soil covers.

Landfill/Solid Waste Facilities

Project Manager for design and permitting of an impoundment for disposal of approximately 700,000 cy of contaminated sediments to be hydraulically dredged from the Grand Calumet River in Gary, Indiana. An approximately 33-acre impoundment was designed to contain the dredged sediments using Resource Conservation Recovery Act (RCRA) Subtitle C liner technology. Liner design consisted of a primary and secondary high density polyethylene (HDPE) geomembrane with granular and geonet drainage layers, overlying a geosynthetic clay liner. A gradient control system was designed below the liner for site dewatering during construction. Design included a soil-bentonite slurry wall around the impoundment to minimize construction dewatering, and to provide tertiary containment of the dredged materials.

Managed numerous construction quality assurance projects for phased development and closure at the Kestrel Hawk Landfill (formerly Land Reclamation Company) in Racine, Wisconsin. Construction projects included clay liners and leachate collection systems, manholes interior to the landfill, compacted clay barrier walls separating the hazardous waste unit from the non-hazardous portion, both clay and RCRA composite (40-mil very low density polyethylene over compacted clay) final covers, dual vertical extraction systems for landfill gas and leachate, and storm water control systems. Managed preparation of contract documents, specifications, and construction drawings.

Geotechnical Analysis

Project Manager for forensic geotechnical analysis following a sudden mass waste movement event at active solid waste landfill in southeastern Wisconsin. Worked with facility owner, WDNR, and subconsultant university professors to investigate probable cause(s), and to develop plan for repair and restoration. Extensive analyses performed to evaluate global and veneer stability of waste mass and liner components. Assessment determined primary factors for waste movement were insufficient interface strength and waste mass geometry (height/width ratio). Restoration relocated about 400,000 cy municipal waste and replacement of geosynthetic liner.

NATURAL
RESOURCE
TECHNOLOGY

Professional Profile

Julie A. Zimdars, PE

Senior Engineer

Summary of Qualifications

Sixteen years of experience in environmental consulting engineering involving the remedial planning, design, construction, and operation and monitoring of various environmental management sites. Experience includes sediment and soil removal remedial planning, and design of landfill cover and leachate collection systems at fly ash disposal facilities. Other experience includes development and implementation of remedial strategies for manufactured gas plant (MGP) coal tar-impacted soil, groundwater and river sediments, and wastewater and storm water permitting. Other projects include brownfields redevelopment, Resource Conservation and Recovery Act (RCRA) corrective actions, and remediation of underground storage tank releases.

Representative Project Experience

Sediment Remediation

Senior Project Engineer responsible for development of the Remedial Scope of Work (SOW) document for polychlorinated biphenyl (PCB) contamination along a 6-mile stretch of creek in Wisconsin. Major components of the SOW included site preparation and erosion controls, creek diversion and monitoring, dewatering system design, identification of removal areas designating Toxic Substance Control Act (TSCA) and non-TSCA materials, identification of post-remedial verification sampling locations, planning for sediment solidification necessary for disposal, and site restoration needs. The SOW identified an estimated 9,000 cubic yards (cy) of creek sediment and 27,300 cy of over bank soils that require removal; about 3,500 cy of soil require disposal as TSCA material.

Senior Project Engineer for the Remedial Investigation/Feasibility Study (RI/FS) and Remedial Design for PCB-contaminated sediment on a portion of the Milwaukee River in Wisconsin. Remedial action includes removal and landfilling of 4,000 cubic yards of TSCA and non-TSCA material.

Project Manager and Lead Engineer for the design and construction management of solidification/stabilization of 6,500 cy of lead-contaminated sediment in the reservoir basin at a former major industrial manufacturing facility in southeastern Wisconsin.

Areas of Expertise

- Remedial Scope of Work planning for sediment removal
- Design and construction of remedial measures for gas and electric utility residuals
- Design of geosynthetic and soil covers and leachate handling facilities
- Soil and groundwater investigation and remediation involving a wide variety of contaminant types
- Feasibility studies for conventional and innovative technologies/approaches
- Pumping system hydraulics and operation, maintenance and optimization of pumping systems
- HELP modeling, contaminant transport modeling
- Site specific soil cleanup standard development
- Regulatory agency liaison support and regulatory compliance
- Brownfields site redevelopment
- Water resource engineering

Education

- M.S., Civil Engineering, UW-Milwaukee, 1994
- B.S., Civil Engineering, UW-Milwaukee, 1991

Professional Registrations

- Professional Engineer #31452 - WI

Professional Affiliations

- American Society of Civil Engineers (ASCE)
- National Ground Water Association (NGWA)
- University of Wisconsin - Milwaukee Industrial Advisory Counsel/Curriculum Advisory Civil Engineering Department

Professional History

- Natural Resource Technology, Inc. (1995 to Present), Senior Engineer
- Montgomery Watson/Warzyn Engineering, Inc. (1992 to 1995), Environmental Engineer
- WDNR Southeast, Wastewater Unit (1991), Industrial Pretreatment Assistant

Publications/Presentations

- FET Environment '05 – Allis-Chalmers Trust Brownfield Redevelopment: City of West Allis Stormwater Retention Basin Project, Co-author

- Field Evaluation of the Co-management of Utility Low-Volume Wastes with High-Volume Coal Combustion By-Products: OK Site, EPRI Final Report 2004, Co-author

- Field Evaluation of the Co-management of Utility Low-Volume Wastes with High-Volume Coal Combustion By-Products: CY Site, EPRI Final Report 2005, Co-author

- Field Evaluation of the Co-management of Utility Low-Volume Wastes with High-Volume Coal Combustion By-Products: PA Site, EPRI Final Report 2006, Co-author

Landfill

Project Manager and Design Engineer for implementation of remediation measures at four closed ash landfills located in southeastern Wisconsin. Major components of the projects included design and construction oversight of either geomembrane or clay/soil covers, drainage systems, ash excavation and relocation, and quality assurance documentation. Design Engineer for two landfill groundwater remediation systems, one at an operating electric power generation facility in Michigan and one at a city landfill in southeastern Wisconsin.

Other projects included ash stabilization and treatability studies, feasibility and cost studies, remedy selection, waste consolidation, and beneficial use of coal combustion products. Performed research on co-management disposal practices of high-volume by-products (fly ash, etc.) and low-volume wastes generated at coal-fired electric generating plants for the Electric Power Research Institute (EPRI).

Former Manufactured Gas Plant/Brownfields

Project Manager/Engineer for two major utility clients in Wisconsin for all aspects of their former manufactured gas plant sites at locations in central and eastern Wisconsin and Upper Michigan. Experience includes engineering and management for the excavation and thermal treatment/landfill disposal of over 100,000 tons of coal tar-impacted soil at various sites. One site involves review and additional evaluation of performance of in-situ stabilization/solidification (ISS) of 14,000 cy of coal tar-impacted soil. Project requirements have included development of site management strategies, cost planning, site histories and subsurface/sediment assessments, feasibility studies, remedy selections, construction, regulatory liaison, public communications, and interfacing with redevelopment interests.

Senior Engineer/Project Manager for the ISS of approximately 8,000 cy of coal tar-impacted material at a former MGP site in southeastern Wisconsin. Extensive coordination was required with the community due to the difficult site access conditions. Project elements included bench scale testing, removal of former MGP infrastructure and restoration for reuse by current property owner.

Project Manager for the redevelopment of a brownfields site at a former major industrial manufacturing facility in southeastern Wisconsin. Project included obtaining a state-funded grant for converting a former cooling water reservoir into a city wet detention basin to serve the community for water quality improvements and integrating environmental remediation into the site-wide redevelopment plan. Project also involved demolition of former pump buildings containing asbestos and management of a PCB-oil remediation system at the site for the past 10 years.

APPENDIX G

ADDITIONAL ANALYTICAL DATA

APPENDIX G1

MAY 2005 GROUNDWATER LABORATORY ANALYTICAL REPORT

Pace Analytical®

1241 Bellevue Street, Suite 9
Green Bay, WI 54302
920-469-2436, Fax: 920-469-8827

Analytical Report Number: 859580

Client: NATURAL RESOURCE TECHNOLOGY
Lab Contact: Tom Trainor
Project Name: WPSC - MANITOWOC
Project Number: 1530

Lab Sample Number	Field ID	Matrix	Collection Date
859580-001	MW-1	GW	05/18/05
859580-002	MW-2	GW	05/18/05
859580-003	MW-5	GW	05/18/05
859580-004	MW-8	GW	05/18/05
859580-005	MW-9	GW	05/18/05
859580-006	MW-10	GW	05/18/05
859580-007	MW-12	GW	05/18/05
859580-008	MW-12D	GW	05/18/05
859580-009	MW-13	GW	05/18/05
859580-010	MW-17T	GW	05/18/05
859580-011	MW-18T	GW	05/18/05
859580-012	MW-19T	GW	05/18/05
859580-013	MW-20T	GW	05/18/05
859580-014	MW-21T	GW	05/18/05
859580-015	QC-1	GW	05/18/05
859580-016	QC-2	GW	05/18/05
859580-017	TB	WATER	05/18/05

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and Laboratory Standard Operating Procedure. Exceptions, if any, are discussed in the accompanying sample comments. Release of this final report is authorized by Laboratory management, as is verified by the following signature. This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc. The sample results relate only to the analytes of interest tested.

Tom Trainor
Approval Signature

5/31/05
Date

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-1

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-001

VOLATILES **Prep Date:** 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1,1,1,2-Tetrachloroethane	<	0.92	0.92	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,1-Trichloroethane	<	0.90	0.90	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2,2-Tetrachloroethane	<	0.20	0.20	0.67		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2-Trichloroethane	<	0.42	0.42	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethane	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethene	<	0.57	0.57	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloropropene	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichlorobenzene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichloropropane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trichlorobenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trimethylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromo-3-chloropropane	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromoethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichlorobenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloroethane	<	0.36	0.36	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloropropane	<	0.46	0.46	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3,5-Trimethylbenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichlorobenzene	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichloropropane	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,4-Dichlorobenzene	<	0.95	0.95	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2,2-Dichloropropane	<	0.62	0.62	2.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2-Chlorotoluene	<	0.85	0.85	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Chlorotoluene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Benzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromobenzene	<	0.82	0.82	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromochloromethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromodichloromethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromoform	<	0.94	0.94	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromomethane	<	0.91	0.91	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Carbon Tetrachloride	<	0.49	0.49	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorobenzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorodibromomethane	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroform	<	0.37	0.37	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloromethane	<	0.24	0.24	0.80		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,2-Dichloroethene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dibromomethane	<	0.60	0.60	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dichlorodifluoromethane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Diisopropyl Ether	<	0.76	0.76	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Ethylbenzene	<	0.54	0.54	1.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Fluorotrichloromethane	<	0.79	0.79	2.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Hexachlorobutadiene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Isopropylbenzene	<	0.59	0.59	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methylene Chloride	<	0.43	0.43	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methyl-tert-butyl-ether	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Naphthalene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
N-Butylbenzene	<	0.93	0.93	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 859580

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-1

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-001

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
n-Propylbenzene	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
p-Isopropyltoluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
sec-Butylbenzene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Styrene	<	0.86	0.86	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
tert-Butylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Tetrachloroethene	<	0.45	0.45	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Toluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,2-Dichloroethene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Trichloroethene		11	0.48	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Vinyl Chloride	<	0.18	0.18	0.60		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylene, o	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylenes, m + p	<	1.8	1.8	6.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Bromofluorobenzene		85				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Toluene-d8		86				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Dibromofluoromethane		84				1	%Recov		05/24/05	SW846 5030B	SW846 8260B

PAH/ PNA

Prep Date: 05/23/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	0.80	0.80	2.7		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	0.91	0.91	3.0		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Acenaphthene	<	0.78	0.78	2.6		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	0.77	0.77	2.6		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Anthracene		0.75	0.71	2.4		40	ug/L	Q	05/25/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		4.4	0.78	2.6		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene		10	0.72	2.4		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene		11	0.72	2.4		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene		9.8	0.83	2.8		40	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene		10	0.77	2.6		40	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Chrysene		8.9	0.66	2.2		40	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		2.1	0.88	2.9		40	ug/L	Q&	05/25/05	SW846 3510C	8270C-SIM
Fluoranthene		13	0.66	2.2		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Fluorene	<	0.87	0.87	2.9		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		7.8	0.68	2.3		40	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Naphthalene	<	0.89	0.89	3.0		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Phenanthrene		4.7	0.82	2.7		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Pyrene		9.5	0.65	2.2		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Nitrobenzene-d5		0				40	%Recov	D	05/25/05	SW846 3510C	8270C-SIM
2-Fluorobiphenyl		0				40	%Recov	D	05/25/05	SW846 3510C	8270C-SIM
Terphenyl-d14		0				40	%Recov	D	05/25/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-2

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-002

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1,1,1,2-Tetrachloroethane	<	0.92	0.92	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,1-Trichloroethane	<	0.90	0.90	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2,2-Tetrachloroethane	<	0.20	0.20	0.67		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2-Trichloroethane	<	0.42	0.42	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethane	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethene	<	0.57	0.57	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloropropene	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichlorobenzene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichloropropane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trichlorobenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trimethylbenzene		4.4	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromo-3-chloropropane	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromoethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichlorobenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloroethane	<	0.36	0.36	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloropropane	<	0.46	0.46	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3,5-Trimethylbenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichlorobenzene	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichloropropane	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,4-Dichlorobenzene	<	0.95	0.95	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2,2-Dichloropropane	<	0.62	0.62	2.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2-Chlorotoluene	<	0.85	0.85	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Chlorotoluene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Benzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromobenzene	<	0.82	0.82	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromochloromethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromodichloromethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromoform	<	0.94	0.94	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromomethane	<	0.91	0.91	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Carbon Tetrachloride	<	0.49	0.49	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorobenzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorodibromomethane	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroform	<	0.37	0.37	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloromethane	<	0.24	0.24	0.80		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,2-Dichloroethene		0.91	0.83	2.8		1	ug/L	Q	05/24/05	SW846 5030B	SW846 8260B
cis-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dibromomethane	<	0.60	0.60	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dichlorodifluoromethane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Diisopropyl Ether	<	0.76	0.76	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Ethylbenzene		38	0.54	1.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Fluorotrichloromethane	<	0.79	0.79	2.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Hexachlorobutadiene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Isopropylbenzene		4.1	0.59	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methylene Chloride	<	0.43	0.43	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methyl-tert-butyl-ether	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Naphthalene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
N-Butylbenzene	<	0.93	0.93	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-2

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-002

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
n-Propylbenzene		2.0	0.81	2.7		1	ug/L	Q	05/24/05	SW846 5030B	SW846 8260B
p-Isopropyltoluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
sec-Butylbenzene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Styrene	<	0.86	0.86	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
tert-Butylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Tetrachloroethene	<	0.45	0.45	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Toluene		0.94	0.67	2.2		1	ug/L	Q	05/24/05	SW846 5030B	SW846 8260B
trans-1,2-Dichloroethene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Trichloroethene		50	0.48	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Vinyl Chloride	<	0.18	0.18	0.60		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylene, o		2.6	0.83	2.8		1	ug/L	Q	05/24/05	SW846 5030B	SW846 8260B
Xylenes, m + p	<	1.8	1.8	6.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Bromofluorobenzene		84				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Toluene-d8		86				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Dibromofluoromethane		84				1	%Recov		05/24/05	SW846 5030B	SW846 8260B

PAH/ PNA

Prep Date: 05/23/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene		11	0.80	2.7		40	ug/L	D	05/25/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	0.45	0.45	1.5		20	ug/L		05/24/05	SW846 3510C	8270C-SIM
Acenaphthene		4.2	0.39	1.3		20	ug/L		05/24/05	SW846 3510C	8270C-SIM
Acenaphthylene		2.7	0.39	1.3		20	ug/L		05/24/05	SW846 3510C	8270C-SIM
Anthracene	<	0.35	0.35	1.2		20	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		1.1	0.39	1.3		20	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene		1.2	0.36	1.2		20	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene		1.1	0.36	1.2		20	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene		0.94	0.41	1.4		20	ug/L	Q&	05/24/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene		1.1	0.39	1.3		20	ug/L	Q&	05/24/05	SW846 3510C	8270C-SIM
Chrysene		1.1	0.33	1.1		20	ug/L	&	05/24/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	<	0.44	0.44	1.5		20	ug/L	&	05/24/05	SW846 3510C	8270C-SIM
Fluoranthene		2.3	0.33	1.1		20	ug/L		05/24/05	SW846 3510C	8270C-SIM
Fluorene		0.52	0.44	1.5		20	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		0.77	0.34	1.1		20	ug/L	Q&	05/24/05	SW846 3510C	8270C-SIM
Naphthalene		0.71	0.45	1.5		20	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Phenanthrene		0.74	0.41	1.4		20	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Pyrene		2.0	0.33	1.1		20	ug/L		05/24/05	SW846 3510C	8270C-SIM
Nitrobenzene-d5		0				20	%Recov	D	05/24/05	SW846 3510C	8270C-SIM
2-Fluorobiphenyl		0				20	%Recov	D	05/24/05	SW846 3510C	8270C-SIM
Terphenyl-d14		0				20	%Recov	D	05/24/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-5

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-003

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1,1,1,2-Tetrachloroethane	<	0.92	0.92	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,1-Trichloroethane	<	0.90	0.90	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2,2-Tetrachloroethane	<	0.20	0.20	0.67		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2-Trichloroethane	<	0.42	0.42	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethane	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethene	<	0.57	0.57	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloropropene	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichlorobenzene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichloropropane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trichlorobenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trimethylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromo-3-chloropropane	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromoethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichlorobenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloroethane	<	0.36	0.36	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloropropane	<	0.46	0.46	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3,5-Trimethylbenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichlorobenzene	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichloropropane	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,4-Dichlorobenzene	<	0.95	0.95	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2,2-Dichloropropane	<	0.62	0.62	2.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2-Chlorotoluene	<	0.85	0.85	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Chlorotoluene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Benzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromobenzene	<	0.82	0.82	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromochloromethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromodichloromethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromoform	<	0.94	0.94	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromomethane	<	0.91	0.91	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Carbon Tetrachloride	<	0.49	0.49	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorobenzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorodibromomethane	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroform	<	0.37	0.37	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloromethane	<	0.24	0.24	0.80		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,2-Dichloroethene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dibromomethane	<	0.60	0.60	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dichlorodifluoromethane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Diisopropyl Ether	<	0.76	0.76	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Ethylbenzene	<	0.54	0.54	1.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Fluorotrichloromethane	<	0.79	0.79	2.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Hexachlorobutadiene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Isopropylbenzene	<	0.59	0.59	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methylene Chloride	<	0.43	0.43	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methyl-tert-butyl-ether	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Naphthalene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
N-Butylbenzene	<	0.93	0.93	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 859580

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-5

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-003

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
n-Propylbenzene	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
p-Isopropyltoluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
sec-Butylbenzene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Styrene	<	0.86	0.86	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
tert-Butylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Tetrachloroethene	<	0.45	0.45	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Toluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,2-Dichloroethene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Trichloroethene	<	0.48	0.48	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Vinyl Chloride	<	0.18	0.18	0.60		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylene, o	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylenes, m + p	<	1.8	1.8	6.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Bromofluorobenzene		86				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Toluene-d8		88				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Dibromofluoromethane		86				1	%Recov		05/24/05	SW846 5030B	SW846 8260B

PAH/ PNA

Prep Date: 05/23/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	8.5	8.5	28		200	ug/L		05/25/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	9.6	9.6	32		200	ug/L		05/25/05	SW846 3510C	8270C-SIM
Acenaphthene	<	8.2	8.2	27		200	ug/L		05/25/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	8.2	8.2	27		200	ug/L		05/25/05	SW846 3510C	8270C-SIM
Anthracene	<	7.5	7.5	25		200	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		25	8.3	28		200	ug/L	Q	05/25/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene		58	7.7	26		200	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene		110	7.6	25		200	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene		75	8.7	29		200	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene		98	8.2	27		200	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Chrysene		110	6.9	23		200	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		18	9.3	31		200	ug/L	Q&	05/25/05	SW846 3510C	8270C-SIM
Fluoranthene		190	7.0	23		200	ug/L		05/25/05	SW846 3510C	8270C-SIM
Fluorene	<	9.2	9.2	31		200	ug/L		05/25/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		60	7.2	24		200	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Naphthalene	<	9.5	9.5	32		200	ug/L		05/25/05	SW846 3510C	8270C-SIM
Phenanthrene		48	8.6	29		200	ug/L		05/25/05	SW846 3510C	8270C-SIM
Pyrene		120	6.9	23		200	ug/L		05/25/05	SW846 3510C	8270C-SIM
Nitrobenzene-d5		0				200	%Recov	D	05/25/05	SW846 3510C	8270C-SIM
2-Fluorobiphenyl		0				200	%Recov	D	05/25/05	SW846 3510C	8270C-SIM
Terphenyl-d14		0				200	%Recov	D	05/25/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-8

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-004

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1,1,1,2-Tetrachloroethane	<	0.92	0.92	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,1-Trichloroethane	<	0.90	0.90	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2,2-Tetrachloroethane	<	0.20	0.20	0.67		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2-Trichloroethane	<	0.42	0.42	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethane	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethene	<	0.57	0.57	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloropropene	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichlorobenzene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichloropropane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trichlorobenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trimethylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromo-3-chloropropane	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromoethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichlorobenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloroethane	<	0.36	0.36	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloropropane	<	0.46	0.46	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3,5-Trimethylbenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichlorobenzene	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichloropropane	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,4-Dichlorobenzene	<	0.95	0.95	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2,2-Dichloropropane	<	0.62	0.62	2.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2-Chlorotoluene	<	0.85	0.85	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Chlorotoluene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Benzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromobenzene	<	0.82	0.82	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromochloromethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromodichloromethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromoform	<	0.94	0.94	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromomethane	<	0.91	0.91	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Carbon Tetrachloride	<	0.49	0.49	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorobenzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorodibromomethane	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroform	<	0.37	0.37	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloromethane	<	0.24	0.24	0.80		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,2-Dichloroethene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dibromomethane	<	0.60	0.60	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dichlorodifluoromethane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Diisopropyl Ether	<	0.76	0.76	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Ethylbenzene	<	0.54	0.54	1.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Fluorotrichloromethane	<	0.79	0.79	2.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Hexachlorobutadiene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Isopropylbenzene	<	0.59	0.59	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methylene Chloride	<	0.43	0.43	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methyl-tert-butyl-ether	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Naphthalene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
N-Butylbenzene	<	0.93	0.93	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 859580

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-8

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-004

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
n-Propylbenzene	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
p-Isopropyltoluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
sec-Butylbenzene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Styrene	<	0.86	0.86	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
tert-Butylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Tetrachloroethene	<	0.45	0.45	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Toluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,2-Dichloroethene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Trichloroethene		2.5	0.48	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Vinyl Chloride	<	0.18	0.18	0.60		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylene, o	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylenes, m + p	<	1.8	1.8	6.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Bromofluorobenzene		85				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Toluene-d8		86				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Dibromofluoromethane		84				1	%Recov		05/24/05	SW846 5030B	SW846 8260B

PAH/ PNA

Prep Date: 05/23/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	0.80	0.80	2.7		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	0.91	0.91	3.0		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Acenaphthene	<	0.78	0.78	2.6		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Acenaphthylene		2.0	0.77	2.6		40	ug/L	Q	05/25/05	SW846 3510C	8270C-SIM
Anthracene		1.8	0.71	2.4		40	ug/L	Q	05/25/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		5.5	0.78	2.6		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene		7.8	0.72	2.4		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene		6.2	0.72	2.4		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene		5.6	0.83	2.8		40	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene		6.6	0.77	2.6		40	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Chrysene		6.3	0.66	2.2		40	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		1.2	0.88	2.9		40	ug/L	Q&	05/25/05	SW846 3510C	8270C-SIM
Fluoranthene		13	0.66	2.2		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Fluorene	<	0.87	0.87	2.9		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		4.5	0.68	2.3		40	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Naphthalene	<	0.89	0.89	3.0		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Phenanthrene		3.7	0.82	2.7		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Pyrene		12	0.65	2.2		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Nitrobenzene-d5		0				40	%Recov	D	05/25/05	SW846 3510C	8270C-SIM
2-Fluorobiphenyl		0				40	%Recov	D	05/25/05	SW846 3510C	8270C-SIM
Terphenyl-d14		0				40	%Recov	D	05/25/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-9

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-005

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1,1,1,2-Tetrachloroethane	<	0.92	0.92	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,1-Trichloroethane	<	0.90	0.90	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2,2-Tetrachloroethane	<	0.20	0.20	0.67		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2-Trichloroethane	<	0.42	0.42	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethane	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethene	<	0.57	0.57	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloropropene	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichlorobenzene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichloropropane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trichlorobenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trimethylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromo-3-chloropropane	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromoethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichlorobenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloroethane	<	0.36	0.36	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloropropane	<	0.46	0.46	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3,5-Trimethylbenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichlorobenzene	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichloropropane	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,4-Dichlorobenzene	<	0.95	0.95	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2,2-Dichloropropane	<	0.62	0.62	2.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2-Chlorotoluene	<	0.85	0.85	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Chlorotoluene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Benzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromobenzene	<	0.82	0.82	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromochloromethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromodichloromethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromoform	<	0.94	0.94	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromomethane	<	0.91	0.91	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Carbon Tetrachloride	<	0.49	0.49	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorobenzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorodibromomethane	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroform	<	0.37	0.37	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloromethane	<	0.24	0.24	0.80		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,2-Dichloroethene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dibromomethane	<	0.60	0.60	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dichlorodifluoromethane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Diisopropyl Ether	<	0.76	0.76	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Ethylbenzene	<	0.54	0.54	1.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Fluorotrichloromethane	<	0.79	0.79	2.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Hexachlorobutadiene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Isopropylbenzene	<	0.59	0.59	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methylene Chloride	<	0.43	0.43	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methyl-tert-butyl-ether	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Naphthalene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
N-Butylbenzene	<	0.93	0.93	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 859580

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-9

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-005

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
n-Propylbenzene	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
p-Isopropyltoluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
sec-Butylbenzene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Styrene	<	0.86	0.86	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
tert-Butylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Tetrachloroethene	<	0.45	0.45	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Toluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,2-Dichloroethene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Trichloroethene	<	0.48	0.48	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Vinyl Chloride	<	0.18	0.18	0.60		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylene, o	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylenes, m + p	<	1.8	1.8	6.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Bromofluorobenzene		84				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Toluene-d8		86				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Dibromofluoromethane		87				1	%Recov		05/24/05	SW846 5030B	SW846 8260B

PAH/ PNA

Prep Date: 05/23/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	0.16	0.16	0.53		8	ug/L		05/24/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	0.18	0.18	0.60		8	ug/L		05/24/05	SW846 3510C	8270C-SIM
Acenaphthene	<	0.16	0.16	0.52		8	ug/L		05/24/05	SW846 3510C	8270C-SIM
Acenaphthylene		0.19	0.15	0.52		8	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Anthracene		0.29	0.14	0.47		8	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		0.94	0.16	0.52		8	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene		1.9	0.14	0.48		8	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene		2.5	0.14	0.48		8	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene		2.2	0.17	0.55		8	ug/L	&	05/24/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene		2.0	0.15	0.51		8	ug/L	&	05/24/05	SW846 3510C	8270C-SIM
Chrysene		1.9	0.13	0.44		8	ug/L	&	05/24/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		0.45	0.18	0.59		8	ug/L	Q&	05/24/05	SW846 3510C	8270C-SIM
Fluoranthene		3.1	0.13	0.44		8	ug/L		05/24/05	SW846 3510C	8270C-SIM
Fluorene	<	0.17	0.17	0.58		8	ug/L		05/24/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		1.7	0.14	0.46		8	ug/L	&	05/24/05	SW846 3510C	8270C-SIM
Naphthalene	<	0.18	0.18	0.60		8	ug/L		05/24/05	SW846 3510C	8270C-SIM
Phenanthrene		0.58	0.16	0.54		8	ug/L		05/24/05	SW846 3510C	8270C-SIM
Pyrene		2.4	0.13	0.43		8	ug/L		05/24/05	SW846 3510C	8270C-SIM
Nitrobenzene-d5		106				8	%Recov		05/24/05	SW846 3510C	8270C-SIM
2-Fluorobiphenyl		80				8	%Recov		05/24/05	SW846 3510C	8270C-SIM
Terphenyl-d14		98				8	%Recov		05/24/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 859580

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-10

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-006

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1,1,1,2-Tetrachloroethane	<	0.92	0.92	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,1-Trichloroethane	<	0.90	0.90	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2,2-Tetrachloroethane	<	0.20	0.20	0.67		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2-Trichloroethane	<	0.42	0.42	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethane	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethene	<	0.57	0.57	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloropropene	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichlorobenzene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichloropropane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trichlorobenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trimethylbenzene		7.5	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromo-3-chloropropane	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromoethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichlorobenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloroethane	<	0.36	0.36	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloropropane	<	0.46	0.46	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3,5-Trimethylbenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichlorobenzene	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichloropropane	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,4-Dichlorobenzene	<	0.95	0.95	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2,2-Dichloropropane	<	0.62	0.62	2.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2-Chlorotoluene	<	0.85	0.85	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Chlorotoluene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Benzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromobenzene	<	0.82	0.82	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromochloromethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromodichloromethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromoform	<	0.94	0.94	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromomethane	<	0.91	0.91	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Carbon Tetrachloride	<	0.49	0.49	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorobenzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorodibromomethane	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroform	<	0.37	0.37	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloromethane	<	0.24	0.24	0.80		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,2-Dichloroethene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dibromomethane	<	0.60	0.60	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dichlorodifluoromethane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Diisopropyl Ether		8.7	0.76	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Ethylbenzene	<	0.54	0.54	1.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Fluorotrichloromethane	<	0.79	0.79	2.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Hexachlorobutadiene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Isopropylbenzene	<	0.59	0.59	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methylene Chloride	<	0.43	0.43	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methyl-tert-butyl-ether		1.3	0.61	2.0		1	ug/L	Q	05/24/05	SW846 5030B	SW846 8260B
Naphthalene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
N-Butylbenzene	<	0.93	0.93	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-10

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-006

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
n-Propylbenzene	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
p-Isopropyltoluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
sec-Butylbenzene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Styrene	<	0.86	0.86	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
tert-Butylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Tetrachloroethene	<	0.45	0.45	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Toluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,2-Dichloroethene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Trichloroethene	<	0.48	0.48	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Vinyl Chloride	<	0.18	0.18	0.60		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylene, o	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylenes, m + p	<	1.8	1.8	6.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Bromofluorobenzene		85				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Toluene-d8		86				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Dibromofluoromethane		86				1	%Recov		05/24/05	SW846 5030B	SW846 8260B

PAH/ PNA

Prep Date: 05/23/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene		0.45	0.20	0.66		10	ug/L	Q	05/25/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	0.23	0.23	0.76		10	ug/L		05/25/05	SW846 3510C	8270C-SIM
Acenaphthene		0.66	0.19	0.65		10	ug/L		05/25/05	SW846 3510C	8270C-SIM
Acenaphthylene		0.70	0.19	0.64		10	ug/L		05/25/05	SW846 3510C	8270C-SIM
Anthracene		0.49	0.18	0.59		10	ug/L	Q	05/25/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		1.2	0.20	0.65		10	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene		2.0	0.18	0.60		10	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene		2.3	0.18	0.60		10	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene		2.1	0.21	0.69		10	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene		2.0	0.19	0.64		10	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Chrysene		2.1	0.16	0.55		10	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		0.39	0.22	0.73		10	ug/L	Q&	05/25/05	SW846 3510C	8270C-SIM
Fluoranthene		3.8	0.16	0.55		10	ug/L		05/25/05	SW846 3510C	8270C-SIM
Fluorene		0.31	0.22	0.73		10	ug/L	Q	05/25/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		1.6	0.17	0.57		10	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Naphthalene		0.25	0.22	0.75		10	ug/L	Q	05/25/05	SW846 3510C	8270C-SIM
Phenanthrene		0.84	0.20	0.68		10	ug/L		05/25/05	SW846 3510C	8270C-SIM
Pyrene		3.2	0.16	0.54		10	ug/L		05/25/05	SW846 3510C	8270C-SIM
Nitrobenzene-d5		0.0				10	%Recov	D	05/25/05	SW846 3510C	8270C-SIM
2-Fluorobiphenyl		0.0				10	%Recov	D	05/25/05	SW846 3510C	8270C-SIM
Terphenyl-d14		0.0				10	%Recov	D	05/25/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-12

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-007

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1,1,1,2-Tetrachloroethane	<	0.92	0.92	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,1-Trichloroethane	<	0.90	0.90	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2,2-Tetrachloroethane	<	0.20	0.20	0.67		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2-Trichloroethane	<	0.42	0.42	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethane	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethene	<	0.57	0.57	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloropropene	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichlorobenzene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichloropropane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trichlorobenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trimethylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromo-3-chloropropane	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromoethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichlorobenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloroethane	<	0.36	0.36	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloropropane	<	0.46	0.46	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3,5-Trimethylbenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichlorobenzene	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichloropropane	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,4-Dichlorobenzene	<	0.95	0.95	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2,2-Dichloropropane	<	0.62	0.62	2.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2-Chlorotoluene	<	0.85	0.85	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Chlorotoluene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Benzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromobenzene	<	0.82	0.82	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromochloromethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromodichloromethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromoform	<	0.94	0.94	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromomethane	<	0.91	0.91	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Carbon Tetrachloride	<	0.49	0.49	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorobenzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorodibromomethane	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroform	<	0.37	0.37	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloromethane	<	0.24	0.24	0.80		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,2-Dichloroethene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dibromomethane	<	0.60	0.60	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dichlorodifluoromethane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Diisopropyl Ether	<	0.76	0.76	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Ethylbenzene	<	0.54	0.54	1.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Fluorotrichloromethane	<	0.79	0.79	2.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Hexachlorobutadiene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Isopropylbenzene	<	0.59	0.59	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methylene Chloride	<	0.43	0.43	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methyl-tert-butyl-ether	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Naphthalene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
N-Butylbenzene	<	0.93	0.93	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-12

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-007

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
n-Propylbenzene	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
p-Isopropyltoluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
sec-Butylbenzene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Styrene	<	0.86	0.86	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
tert-Butylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Tetrachloroethene	<	0.45	0.45	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Toluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,2-Dichloroethene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Trichloroethene		0.92	0.48	1.6		1	ug/L	Q	05/24/05	SW846 5030B	SW846 8260B
Vinyl Chloride	<	0.18	0.18	0.60		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylene, o	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylenes, m + p	<	1.8	1.8	6.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Bromofluorobenzene		84				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Toluene-d8		85				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Dibromofluoromethane		86				1	%Recov		05/24/05	SW846 5030B	SW846 8260B

PAH/ PNA

Prep Date: 05/23/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	0.80	0.80	2.7		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	0.91	0.91	3.0		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Acenaphthene	<	0.78	0.78	2.6		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	0.77	0.77	2.6		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Anthracene	<	0.71	0.71	2.4		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		4.5	0.78	2.6		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene		9.5	0.72	2.4		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene		11	0.72	2.4		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene		11	0.83	2.8		40	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene		10	0.77	2.6		40	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Chrysene		8.9	0.66	2.2		40	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		2.2	0.88	2.9		40	ug/L	Q&	05/25/05	SW846 3510C	8270C-SIM
Fluoranthene		13	0.66	2.2		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Fluorene	<	0.87	0.87	2.9		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		8.3	0.68	2.3		40	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Naphthalene	<	0.89	0.89	3.0		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Phenanthrene		2.5	0.82	2.7		40	ug/L	Q	05/25/05	SW846 3510C	8270C-SIM
Pyrene		10	0.65	2.2		40	ug/L		05/25/05	SW846 3510C	8270C-SIM
Nitrobenzene-d5		0				40	%Recov	D	05/25/05	SW846 3510C	8270C-SIM
2-Fluorobiphenyl		0				40	%Recov	D	05/25/05	SW846 3510C	8270C-SIM
Terphenyl-d14		0				40	%Recov	D	05/25/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-12D

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-008

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1,1,1,2-Tetrachloroethane	<	0.92	0.92	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,1-Trichloroethane	<	0.90	0.90	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2,2-Tetrachloroethane	<	0.20	0.20	0.67		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2-Trichloroethane	<	0.42	0.42	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethane	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethene	<	0.57	0.57	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloropropene	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichlorobenzene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichloropropane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trichlorobenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trimethylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromo-3-chloropropane	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromoethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichlorobenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloroethane	<	0.36	0.36	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloropropane	<	0.46	0.46	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3,5-Trimethylbenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichlorobenzene	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichloropropane	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,4-Dichlorobenzene	<	0.95	0.95	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2,2-Dichloropropane	<	0.62	0.62	2.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2-Chlorotoluene	<	0.85	0.85	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Chlorotoluene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Benzene		2.3	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromobenzene	<	0.82	0.82	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromochloromethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromodichloromethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromoform	<	0.94	0.94	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromomethane	<	0.91	0.91	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Carbon Tetrachloride	<	0.49	0.49	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorobenzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorodibromomethane	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroform	<	0.37	0.37	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloromethane	<	0.24	0.24	0.80		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,2-Dichloroethene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dibromomethane	<	0.60	0.60	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dichlorodifluoromethane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Diisopropyl Ether	<	0.76	0.76	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Ethylbenzene	<	0.54	0.54	1.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Fluorotrichloromethane	<	0.79	0.79	2.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Hexachlorobutadiene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Isopropylbenzene	<	0.59	0.59	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methylene Chloride	<	0.43	0.43	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methyl-tert-butyl-ether	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Naphthalene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
N-Butylbenzene	<	0.93	0.93	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-12D

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-008

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
n-Propylbenzene	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
p-Isopropyltoluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
sec-Butylbenzene		1.3	0.89	3.0		1	ug/L	Q	05/24/05	SW846 5030B	SW846 8260B
Styrene	<	0.86	0.86	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
tert-Butylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Tetrachloroethene	<	0.45	0.45	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Toluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,2-Dichloroethene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Trichloroethene		1.7	0.48	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Vinyl Chloride	<	0.18	0.18	0.60		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylene, o	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylenes, m + p	<	1.8	1.8	6.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Bromofluorobenzene		86				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Toluene-d8		86				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Dibromofluoromethane		85				1	%Recov		05/24/05	SW846 5030B	SW846 8260B

PAH/ PNA

Prep Date: 05/23/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene		0.10	0.080	0.27		4	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	0.091	0.091	0.30		4	ug/L		05/24/05	SW846 3510C	8270C-SIM
Acenaphthene	<	0.078	0.078	0.26		4	ug/L		05/24/05	SW846 3510C	8270C-SIM
Acenaphthylene		0.11	0.077	0.26		4	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Anthracene	<	0.071	0.071	0.24		4	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		0.45	0.078	0.26		4	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene		0.84	0.072	0.24		4	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene		1.2	0.072	0.24		4	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene		1.0	0.083	0.28		4	ug/L	&	05/24/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene		0.88	0.077	0.26		4	ug/L	&	05/24/05	SW846 3510C	8270C-SIM
Chrysene		0.80	0.066	0.22		4	ug/L	&	05/24/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		0.22	0.088	0.29		4	ug/L	Q&	05/24/05	SW846 3510C	8270C-SIM
Fluoranthene		1.1	0.066	0.22		4	ug/L		05/24/05	SW846 3510C	8270C-SIM
Fluorene	<	0.087	0.087	0.29		4	ug/L		05/24/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		0.80	0.068	0.23		4	ug/L	&	05/24/05	SW846 3510C	8270C-SIM
Naphthalene		0.50	0.089	0.30		4	ug/L		05/24/05	SW846 3510C	8270C-SIM
Phenanthrene		0.21	0.082	0.27		4	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Pyrene		0.80	0.065	0.22		4	ug/L		05/24/05	SW846 3510C	8270C-SIM
Nitrobenzene-d5		121				4	%Recov		05/24/05	SW846 3510C	8270C-SIM
2-Fluorobiphenyl		94				4	%Recov		05/24/05	SW846 3510C	8270C-SIM
Terphenyl-d14		89				4	%Recov		05/24/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-13

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-009

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1,1,1,2-Tetrachloroethane	<	18	18	61		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,1-Trichloroethane	<	18	18	60		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2,2-Tetrachloroethane	<	4.0	4.0	13		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2-Trichloroethane	<	8.4	8.4	28		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethane	<	15	15	50		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethene	<	11	11	38		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloropropene	<	15	15	50		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichlorobenzene	<	15	15	49		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichloropropane	<	20	20	66		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trichlorobenzene	<	19	19	65		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trimethylbenzene		110	19	65		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromo-3-chloropropane	<	17	17	58		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromoethane	<	11	11	37		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichlorobenzene	<	17	17	55		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloroethane	<	7.2	7.2	24		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloropropane	<	9.2	9.2	31		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3,5-Trimethylbenzene		28	17	55		20	ug/L	Q	05/24/05	SW846 5030B	SW846 8260B
1,3-Dichlorobenzene	<	17	17	58		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichloropropane	<	12	12	41		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,4-Dichlorobenzene	<	19	19	63		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
2,2-Dichloropropane	<	12	12	41		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
2-Chlorotoluene	<	17	17	57		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Chlorotoluene	<	15	15	49		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Benzene		270	8.2	27		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromobenzene	<	16	16	55		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromochloromethane	<	19	19	65		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromodichloromethane	<	11	11	37		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromoform	<	19	19	63		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromomethane	<	18	18	61		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Carbon Tetrachloride	<	9.8	9.8	33		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorobenzene	<	8.2	8.2	27		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorodibromomethane	<	16	16	54		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroethane	<	19	19	65		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroform	<	7.4	7.4	25		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloromethane	<	4.8	4.8	16		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,2-Dichloroethene	<	17	17	55		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,3-Dichloropropene	<	3.8	3.8	13		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dibromomethane	<	12	12	40		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dichlorodifluoromethane	<	20	20	66		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Diisopropyl Ether	<	15	15	51		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Ethylbenzene		670	11	36		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Fluorotrichloromethane	<	16	16	53		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Hexachlorobutadiene	<	13	13	45		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Isopropylbenzene		37	12	39		20	ug/L	Q	05/24/05	SW846 5030B	SW846 8260B
Methylene Chloride	<	8.6	8.6	29		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methyl-tert-butyl-ether	<	12	12	41		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Naphthalene		1800	15	49		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
N-Butylbenzene	<	19	19	62		20	ug/L		05/24/05	SW846 5030B	SW846 8260B

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-13

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-009

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
n-Propylbenzene	<	16	16	54		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
p-Isopropyltoluene	<	13	13	45		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
sec-Butylbenzene	<	18	18	59		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Styrene	<	17	17	57		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
tert-Butylbenzene	<	19	19	65		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Tetrachloroethene	<	9.0	9.0	30		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Toluene		17	13	45		20	ug/L	Q	05/24/05	SW846 5030B	SW846 8260B
trans-1,2-Dichloroethene	<	18	18	59		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,3-Dichloropropene	<	3.8	3.8	13		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Trichloroethene	<	9.6	9.6	32		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Vinyl Chloride	<	3.6	3.6	12		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylene, o		310	17	55		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylenes, m + p		220	36	120		20	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Bromofluorobenzene		85				20	%Recov		05/24/05	SW846 5030B	SW846 8260B
Toluene-d8		85				20	%Recov		05/24/05	SW846 5030B	SW846 8260B
Dibromofluoromethane		86				20	%Recov		05/24/05	SW846 5030B	SW846 8260B

PAH/ PNA

Prep Date: 05/23/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene		190	50	170		2500	ug/L	D	05/25/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene		66	57	190		2500	ug/L	QD	05/25/05	SW846 3510C	8270C-SIM
Acenaphthene		51	48	160		2500	ug/L	QD	05/25/05	SW846 3510C	8270C-SIM
Acenaphthylene		4.5	1.9	6.4		100	ug/L	Q	05/25/05	SW846 3510C	8270C-SIM
Anthracene	<	1.8	1.8	5.9		100	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene	<	2.0	2.0	6.5		100	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	1.8	1.8	6.0		100	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	1.8	1.8	6.0		100	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	2.1	2.1	6.9		100	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	1.9	1.9	6.4		100	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Chrysene	<	1.6	1.6	5.5		100	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	<	2.2	2.2	7.3		100	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Fluoranthene		2.0	1.6	5.5		100	ug/L	Q	05/25/05	SW846 3510C	8270C-SIM
Fluorene		3.5	2.2	7.3		100	ug/L	Q	05/25/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene	<	1.7	1.7	5.7		100	ug/L	&	05/25/05	SW846 3510C	8270C-SIM
Naphthalene		920	56	190		2500	ug/L	D	05/25/05	SW846 3510C	8270C-SIM
Phenanthrene	<	2.0	2.0	6.8		100	ug/L		05/25/05	SW846 3510C	8270C-SIM
Pyrene	<	1.6	1.6	5.4		100	ug/L		05/25/05	SW846 3510C	8270C-SIM
Nitrobenzene-d5		0				100	%Recov	D	05/25/05	SW846 3510C	8270C-SIM
2-Fluorobiphenyl		0				100	%Recov	D	05/25/05	SW846 3510C	8270C-SIM
Terphenyl-d14		0				100	%Recov	D	05/25/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-17T

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-010

VOLATILES **Prep Date:** 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1,1,1,2-Tetrachloroethane	<	0.92	0.92	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,1-Trichloroethane	<	0.90	0.90	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2,2-Tetrachloroethane	<	0.20	0.20	0.67		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2-Trichloroethane	<	0.42	0.42	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethane	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethene	<	0.57	0.57	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloropropene	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichlorobenzene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichloropropane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trichlorobenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trimethylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromo-3-chloropropane	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromoethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichlorobenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloroethane	<	0.36	0.36	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloropropane	<	0.46	0.46	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3,5-Trimethylbenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichlorobenzene	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichloropropane	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,4-Dichlorobenzene	<	0.95	0.95	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2,2-Dichloropropane	<	0.62	0.62	2.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2-Chlorotoluene	<	0.85	0.85	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Chlorotoluene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Benzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromobenzene	<	0.82	0.82	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromochloromethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromodichloromethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromoform	<	0.94	0.94	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromomethane	<	0.91	0.91	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Carbon Tetrachloride	<	0.49	0.49	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorobenzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorodibromomethane	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroform	<	0.37	0.37	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloromethane	<	0.24	0.24	0.80		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,2-Dichloroethene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dibromomethane	<	0.60	0.60	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dichlorodifluoromethane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Diisopropyl Ether	<	0.76	0.76	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Ethylbenzene	<	0.54	0.54	1.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Fluorotrichloromethane	<	0.79	0.79	2.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Hexachlorobutadiene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Isopropylbenzene	<	0.59	0.59	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methylene Chloride	<	0.43	0.43	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methyl-tert-butyl-ether	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Naphthalene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
N-Butylbenzene	<	0.93	0.93	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 859580

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-17T

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-010

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
n-Propylbenzene	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
p-Isopropyltoluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
sec-Butylbenzene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Styrene	<	0.86	0.86	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
tert-Butylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Tetrachloroethene	<	0.45	0.45	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Toluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,2-Dichloroethene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Trichloroethene		89	0.48	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Vinyl Chloride	<	0.18	0.18	0.60		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylene, o	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylenes, m + p	<	1.8	1.8	6.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Bromofluorobenzene		83				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Toluene-d8		86				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Dibromofluoromethane		84				1	%Recov		05/24/05	SW846 5030B	SW846 8260B

PAH/ PNA

Prep Date: 05/23/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	0.020	0.020	0.066		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	0.023	0.023	0.076		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Acenaphthene	<	0.019	0.019	0.065		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	0.019	0.019	0.064		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Anthracene	<	0.018	0.018	0.059		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene	<	0.020	0.020	0.065		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene		0.030	0.018	0.060		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene		0.032	0.018	0.060		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene		0.031	0.021	0.069		1	ug/L	Q&	05/24/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene		0.030	0.019	0.064		1	ug/L	Q&	05/24/05	SW846 3510C	8270C-SIM
Chrysene		0.026	0.016	0.055		1	ug/L	Q&	05/24/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	<	0.022	0.022	0.073		1	ug/L	&	05/24/05	SW846 3510C	8270C-SIM
Fluoranthene		0.037	0.016	0.055		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Fluorene	<	0.022	0.022	0.073		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		0.024	0.017	0.057		1	ug/L	Q&	05/24/05	SW846 3510C	8270C-SIM
Naphthalene		0.046	0.022	0.075		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Phenanthrene	<	0.020	0.020	0.068		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Pyrene		0.033	0.016	0.054		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Nitrobenzene-d5		111				1	%Recov		05/24/05	SW846 3510C	8270C-SIM
2-Fluorobiphenyl		84				1	%Recov		05/24/05	SW846 3510C	8270C-SIM
Terphenyl-d14		96				1	%Recov		05/24/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-18T

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-011

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1,1,1,2-Tetrachloroethane	<	0.92	0.92	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,1-Trichloroethane	<	0.90	0.90	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2,2-Tetrachloroethane	<	0.20	0.20	0.67		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2-Trichloroethane	<	0.42	0.42	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethane	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethene	<	0.57	0.57	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloropropene	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichlorobenzene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichloropropane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trichlorobenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trimethylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromo-3-chloropropane	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromoethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichlorobenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloroethane	<	0.36	0.36	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloropropane	<	0.46	0.46	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3,5-Trimethylbenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichlorobenzene	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichloropropane	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,4-Dichlorobenzene	<	0.95	0.95	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2,2-Dichloropropane	<	0.62	0.62	2.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2-Chlorotoluene	<	0.85	0.85	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Chlorotoluene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Benzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromobenzene	<	0.82	0.82	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromochloromethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromodichloromethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromoform	<	0.94	0.94	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromomethane	<	0.91	0.91	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Carbon Tetrachloride	<	0.49	0.49	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorobenzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorodibromomethane	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroform	<	0.37	0.37	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloromethane	<	0.24	0.24	0.80		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,2-Dichloroethene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dibromomethane	<	0.60	0.60	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dichlorodifluoromethane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Diisopropyl Ether	<	0.76	0.76	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Ethylbenzene	<	0.54	0.54	1.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Fluorotrichloromethane	<	0.79	0.79	2.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Hexachlorobutadiene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Isopropylbenzene	<	0.59	0.59	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methylene Chloride	<	0.43	0.43	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methyl-tert-butyl-ether	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Naphthalene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
N-Butylbenzene	<	0.93	0.93	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-18T

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-011

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
n-Propylbenzene	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
p-Isopropyltoluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
sec-Butylbenzene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Styrene	<	0.86	0.86	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
tert-Butylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Tetrachloroethene	<	0.45	0.45	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Toluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,2-Dichloroethene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Trichloroethene		56	0.48	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Vinyl Chloride	<	0.18	0.18	0.60		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylene, o	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylenes, m + p	<	1.8	1.8	6.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Bromofluorobenzene		84				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Toluene-d8		85				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Dibromofluoromethane		86				1	%Recov		05/24/05	SW846 5030B	SW846 8260B

PAH/ PNA

Prep Date: 05/23/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	0.020	0.020	0.066		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	0.023	0.023	0.076		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Acenaphthene	<	0.019	0.019	0.065		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	0.019	0.019	0.064		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Anthracene	<	0.018	0.018	0.059		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene	<	0.020	0.020	0.065		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene		0.019	0.018	0.060		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene		0.022	0.018	0.060		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	0.021	0.021	0.069		1	ug/L	&	05/24/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	0.019	0.019	0.064		1	ug/L	&	05/24/05	SW846 3510C	8270C-SIM
Chrysene		0.019	0.016	0.055		1	ug/L	Q&	05/24/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	<	0.022	0.022	0.073		1	ug/L	&	05/24/05	SW846 3510C	8270C-SIM
Fluoranthene		0.030	0.016	0.055		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Fluorene	<	0.022	0.022	0.073		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene	<	0.017	0.017	0.057		1	ug/L	&	05/24/05	SW846 3510C	8270C-SIM
Naphthalene	<	0.022	0.022	0.075		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Phenanthrene	<	0.020	0.020	0.068		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Pyrene		0.025	0.016	0.054		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Nitrobenzene-d5		108				1	%Recov		05/24/05	SW846 3510C	8270C-SIM
2-Fluorobiphenyl		85				1	%Recov		05/24/05	SW846 3510C	8270C-SIM
Terphenyl-d14		89				1	%Recov		05/24/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-19T

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-012

VOLATILES **Prep Date:** 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1,1,1,2-Tetrachloroethane	<	0.92	0.92	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,1-Trichloroethane	<	0.90	0.90	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2,2-Tetrachloroethane	<	0.20	0.20	0.67		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2-Trichloroethane	<	0.42	0.42	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethane	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethene	<	0.57	0.57	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloropropene	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichlorobenzene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichloropropane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trichlorobenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trimethylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromo-3-chloropropane	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromoethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichlorobenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloroethane	<	0.36	0.36	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloropropane	<	0.46	0.46	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3,5-Trimethylbenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichlorobenzene	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichloropropane	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,4-Dichlorobenzene	<	0.95	0.95	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2,2-Dichloropropane	<	0.62	0.62	2.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2-Chlorotoluene	<	0.85	0.85	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Chlorotoluene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Benzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromobenzene	<	0.82	0.82	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromochloromethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromodichloromethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromoform	<	0.94	0.94	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromomethane	<	0.91	0.91	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Carbon Tetrachloride	<	0.49	0.49	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorobenzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorodibromomethane	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroform	<	0.37	0.37	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloromethane	<	0.24	0.24	0.80		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,2-Dichloroethene		3.6	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dibromomethane	<	0.60	0.60	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dichlorodifluoromethane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Diisopropyl Ether	<	0.76	0.76	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Ethylbenzene	<	0.54	0.54	1.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Fluorotrichloromethane	<	0.79	0.79	2.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Hexachlorobutadiene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Isopropylbenzene	<	0.59	0.59	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methylene Chloride	<	0.43	0.43	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methyl-tert-butyl-ether	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Naphthalene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
N-Butylbenzene	<	0.93	0.93	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-19T

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-012

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
n-Propylbenzene	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
p-Isopropyltoluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
sec-Butylbenzene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Styrene	<	0.86	0.86	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
tert-Butylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Tetrachloroethene	<	0.45	0.45	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Toluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,2-Dichloroethene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Trichloroethene		85	0.48	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Vinyl Chloride	<	0.18	0.18	0.60		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylene, o	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylenes, m + p	<	1.8	1.8	6.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Bromofluorobenzene		88				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Toluene-d8		86				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Dibromofluoromethane		84				1	%Recov		05/24/05	SW846 5030B	SW846 8260B

PAH/ PNA

Prep Date: 05/23/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	0.020	0.020	0.066		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	0.023	0.023	0.076		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Acenaphthene	<	0.019	0.019	0.065		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Acenaphthylene		0.040	0.019	0.064		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Anthracene		0.026	0.018	0.059		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		0.10	0.020	0.065		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene		0.17	0.018	0.060		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene		0.21	0.018	0.060		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene		0.20	0.021	0.069		1	ug/L	&	05/24/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene		0.16	0.019	0.064		1	ug/L	&	05/24/05	SW846 3510C	8270C-SIM
Chrysene		0.14	0.016	0.055		1	ug/L	&	05/24/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		0.041	0.022	0.073		1	ug/L	Q&	05/24/05	SW846 3510C	8270C-SIM
Fluoranthene		0.24	0.016	0.055		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Fluorene	<	0.022	0.022	0.073		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		0.16	0.017	0.057		1	ug/L	&	05/24/05	SW846 3510C	8270C-SIM
Naphthalene		0.069	0.022	0.075		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Phenanthrene		0.075	0.020	0.068		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Pyrene		0.20	0.016	0.054		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Nitrobenzene-d5		107				1	%Recov		05/24/05	SW846 3510C	8270C-SIM
2-Fluorobiphenyl		79				1	%Recov		05/24/05	SW846 3510C	8270C-SIM
Terphenyl-d14		76				1	%Recov		05/24/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-20T

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-013

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1,1,1,2-Tetrachloroethane	<	0.92	0.92	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,1-Trichloroethane	<	0.90	0.90	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2,2-Tetrachloroethane	<	0.20	0.20	0.67		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2-Trichloroethane	<	0.42	0.42	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethane	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethene	<	0.57	0.57	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloropropene	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichlorobenzene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichloropropane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trichlorobenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trimethylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromo-3-chloropropane	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromoethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichlorobenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloroethane	<	0.36	0.36	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloropropane	<	0.46	0.46	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3,5-Trimethylbenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichlorobenzene	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichloropropane	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,4-Dichlorobenzene	<	0.95	0.95	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2,2-Dichloropropane	<	0.62	0.62	2.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2-Chlorotoluene	<	0.85	0.85	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Chlorotoluene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Benzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromobenzene	<	0.82	0.82	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromochloromethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromodichloromethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromoform	<	0.94	0.94	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromomethane	<	0.91	0.91	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Carbon Tetrachloride	<	0.49	0.49	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorobenzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorodibromomethane	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroform	<	0.37	0.37	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloromethane	<	0.24	0.24	0.80		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,2-Dichloroethene		30	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dibromomethane	<	0.60	0.60	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dichlorodifluoromethane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Diisopropyl Ether	<	0.76	0.76	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Ethylbenzene	<	0.54	0.54	1.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Fluorotrichloromethane	<	0.79	0.79	2.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Hexachlorobutadiene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Isopropylbenzene	<	0.59	0.59	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methylene Chloride	<	0.43	0.43	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methyl-tert-butyl-ether	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Naphthalene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
N-Butylbenzene	<	0.93	0.93	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 859580

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-20T

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-013

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
n-Propylbenzene	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
p-Isopropyltoluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
sec-Butylbenzene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Styrene	<	0.86	0.86	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
tert-Butylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Tetrachloroethene	<	0.45	0.45	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Toluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,2-Dichloroethene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Trichloroethene		90	0.48	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Vinyl Chloride	<	0.18	0.18	0.60		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylene, o	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylenes, m + p	<	1.8	1.8	6.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Bromofluorobenzene		85				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Toluene-d8		84				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Dibromofluoromethane		84				1	%Recov		05/24/05	SW846 5030B	SW846 8260B

PAH/ PNA

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	0.020	0.020	0.066		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	0.023	0.023	0.076		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Acenaphthene	<	0.019	0.019	0.065		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Acenaphthylene	<	0.019	0.019	0.064		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Anthracene	<	0.018	0.018	0.059		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene	<	0.020	0.020	0.065		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene		0.027	0.018	0.060		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene		0.035	0.018	0.060		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene		0.029	0.021	0.069		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene		0.027	0.019	0.064		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Chrysene		0.029	0.016	0.055		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	<	0.022	0.022	0.073		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Fluoranthene		0.046	0.016	0.055		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Fluorene	<	0.022	0.022	0.073		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		0.022	0.017	0.057		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Naphthalene		0.039	0.022	0.075		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Phenanthrene		0.023	0.020	0.068		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Pyrene		0.037	0.016	0.054		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Nitrobenzene-d5		112				1	%Recov		05/24/05	SW846 3510C	8270C-SIM
2-Fluorobiphenyl		85				1	%Recov		05/24/05	SW846 3510C	8270C-SIM
Terphenyl-d14		94				1	%Recov		05/24/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-21T

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-014

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1,1,1,2-Tetrachloroethane	<	0.92	0.92	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,1-Trichloroethane	<	0.90	0.90	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2,2-Tetrachloroethane	<	0.20	0.20	0.67		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2-Trichloroethane	<	0.42	0.42	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethane	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethene	<	0.57	0.57	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloropropene	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichlorobenzene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichloropropane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trichlorobenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trimethylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromo-3-chloropropane	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromoethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichlorobenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloroethane	<	0.36	0.36	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloropropane	<	0.46	0.46	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3,5-Trimethylbenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichlorobenzene	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichloropropane	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,4-Dichlorobenzene	<	0.95	0.95	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2,2-Dichloropropane	<	0.62	0.62	2.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2-Chlorotoluene	<	0.85	0.85	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Chlorotoluene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Benzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromobenzene	<	0.82	0.82	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromochloromethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromodichloromethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromoform	<	0.94	0.94	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromomethane	<	0.91	0.91	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Carbon Tetrachloride	<	0.49	0.49	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorobenzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorodibromomethane	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroform	<	0.37	0.37	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloromethane	<	0.24	0.24	0.80		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,2-Dichloroethene		38	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dibromomethane	<	0.60	0.60	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dichlorodifluoromethane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Diisopropyl Ether	<	0.76	0.76	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Ethylbenzene	<	0.54	0.54	1.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Fluorotrichloromethane	<	0.79	0.79	2.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Hexachlorobutadiene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Isopropylbenzene	<	0.59	0.59	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methylene Chloride	<	0.43	0.43	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methyl-tert-butyl-ether	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Naphthalene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
N-Butylbenzene	<	0.93	0.93	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : MW-21T

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-014

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
n-Propylbenzene	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
p-Isopropyltoluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
sec-Butylbenzene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Styrene	<	0.86	0.86	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
tert-Butylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Tetrachloroethene	<	0.45	0.45	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Toluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,2-Dichloroethene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Trichloroethene		54	0.48	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Vinyl Chloride	<	0.18	0.18	0.60		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylene, o	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylenes, m + p	<	1.8	1.8	6.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Bromofluorobenzene		85				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Toluene-d8		84				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Dibromofluoromethane		86				1	%Recov		05/24/05	SW846 5030B	SW846 8260B

PAH/ PNA

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene		0.030	0.020	0.066		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	0.023	0.023	0.076		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Acenaphthene		0.18	0.019	0.065		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Acenaphthylene		0.75	0.048	0.16		2.5	ug/L	D	05/25/05	SW846 3510C	8270C-SIM
Anthracene	<	0.018	0.018	0.059		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		0.049	0.020	0.065		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene		0.11	0.018	0.060		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene		0.12	0.018	0.060		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene		0.15	0.021	0.069		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene		0.11	0.019	0.064		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Chrysene		0.092	0.016	0.055		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		0.031	0.022	0.073		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Fluoranthene		0.15	0.016	0.055		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Fluorene		0.068	0.022	0.073		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		0.11	0.017	0.057		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Naphthalene		0.049	0.022	0.075		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Phenanthrene		0.059	0.020	0.068		1	ug/L	Q	05/24/05	SW846 3510C	8270C-SIM
Pyrene		0.11	0.016	0.054		1	ug/L		05/24/05	SW846 3510C	8270C-SIM
Nitrobenzene-d5		108				1	%Recov		05/24/05	SW846 3510C	8270C-SIM
2-Fluorobiphenyl		78				1	%Recov		05/24/05	SW846 3510C	8270C-SIM
Terphenyl-d14		86				1	%Recov		05/24/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : QC-1

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-015

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1,1,1,2-Tetrachloroethane	<	0.92	0.92	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,1-Trichloroethane	<	0.90	0.90	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2,2-Tetrachloroethane	<	0.20	0.20	0.67		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2-Trichloroethane	<	0.42	0.42	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethane	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethene	<	0.57	0.57	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloropropene	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichlorobenzene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichloropropane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trichlorobenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trimethylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromo-3-chloropropane	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromoethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichlorobenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloroethane	<	0.36	0.36	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloropropane	<	0.46	0.46	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3,5-Trimethylbenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichlorobenzene	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichloropropane	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,4-Dichlorobenzene	<	0.95	0.95	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2,2-Dichloropropane	<	0.62	0.62	2.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2-Chlorotoluene	<	0.85	0.85	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Chlorotoluene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Benzene		5.3	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromobenzene	<	0.82	0.82	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromochloromethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromodichloromethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromoform	<	0.94	0.94	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromomethane	<	0.91	0.91	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Carbon Tetrachloride	<	0.49	0.49	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorobenzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorodibromomethane	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroform	<	0.37	0.37	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloromethane	<	0.24	0.24	0.80		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,2-Dichloroethene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dibromomethane	<	0.60	0.60	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dichlorodifluoromethane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Diisopropyl Ether	<	0.76	0.76	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Ethylbenzene	<	0.54	0.54	1.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Fluorotrichloromethane	<	0.79	0.79	2.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Hexachlorobutadiene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Isopropylbenzene		1.2	0.59	2.0		1	ug/L	Q	05/24/05	SW846 5030B	SW846 8260B
Methylene Chloride	<	0.43	0.43	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methyl-tert-butyl-ether	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Naphthalene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
N-Butylbenzene	<	0.93	0.93	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : QC-1

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-015

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
n-Propylbenzene	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
p-Isopropyltoluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
sec-Butylbenzene		1.5	0.89	3.0		1	ug/L	Q	05/24/05	SW846 5030B	SW846 8260B
Styrene	<	0.86	0.86	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
tert-Butylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Tetrachloroethene	<	0.45	0.45	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Toluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,2-Dichloroethene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Trichloroethene		1.6	0.48	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Vinyl Chloride	<	0.18	0.18	0.60		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylene, o	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylenes, m + p	<	1.8	1.8	6.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Bromofluorobenzene		84				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Toluene-d8		84				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Dibromofluoromethane		82				1	%Recov		05/24/05	SW846 5030B	SW846 8260B

PAH/ PNA

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	<	0.10	0.10	0.33		5	ug/L		05/26/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	0.11	0.11	0.38		5	ug/L		05/26/05	SW846 3510C	8270C-SIM
Acenaphthene	<	0.097	0.097	0.32		5	ug/L		05/26/05	SW846 3510C	8270C-SIM
Acenaphthylene		0.12	0.097	0.32		5	ug/L	Q	05/26/05	SW846 3510C	8270C-SIM
Anthracene	<	0.088	0.088	0.29		5	ug/L		05/26/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		0.51	0.098	0.33		5	ug/L		05/26/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene		0.94	0.091	0.30		5	ug/L		05/26/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene		1.2	0.089	0.30		5	ug/L		05/26/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene		1.0	0.10	0.34		5	ug/L		05/26/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene		1.1	0.097	0.32		5	ug/L		05/26/05	SW846 3510C	8270C-SIM
Chrysene		0.93	0.082	0.27		5	ug/L		05/26/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene		0.21	0.11	0.37		5	ug/L	Q	05/26/05	SW846 3510C	8270C-SIM
Fluoranthene		1.1	0.082	0.27		5	ug/L		05/26/05	SW846 3510C	8270C-SIM
Fluorene	<	0.11	0.11	0.36		5	ug/L		05/26/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		0.81	0.085	0.28		5	ug/L		05/26/05	SW846 3510C	8270C-SIM
Naphthalene	<	0.11	0.11	0.37		5	ug/L		05/26/05	SW846 3510C	8270C-SIM
Phenanthrene		0.25	0.10	0.34		5	ug/L	Q	05/26/05	SW846 3510C	8270C-SIM
Pyrene		0.97	0.081	0.27		5	ug/L		05/26/05	SW846 3510C	8270C-SIM
Nitrobenzene-d5		96				5	%Recov		05/26/05	SW846 3510C	8270C-SIM
2-Fluorobiphenyl		80				5	%Recov		05/26/05	SW846 3510C	8270C-SIM
Terphenyl-d14		99				5	%Recov		05/26/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : QC-2

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-016

VOLATILES **Prep Date:** 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1,1,1,2-Tetrachloroethane	<	0.92	0.92	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,1-Trichloroethane	<	0.90	0.90	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2,2-Tetrachloroethane	<	0.20	0.20	0.67		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2-Trichloroethane	<	0.42	0.42	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethane	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethene	<	0.57	0.57	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloropropene	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichlorobenzene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichloropropane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trichlorobenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trimethylbenzene		4.3	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromo-3-chloropropane	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromoethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichlorobenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloroethane	<	0.36	0.36	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloropropane	<	0.46	0.46	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3,5-Trimethylbenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichlorobenzene	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichloropropane	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,4-Dichlorobenzene	<	0.95	0.95	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2,2-Dichloropropane	<	0.62	0.62	2.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2-Chlorotoluene	<	0.85	0.85	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Chlorotoluene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Benzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromobenzene	<	0.82	0.82	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromochloromethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromodichloromethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromoform	<	0.94	0.94	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromomethane	<	0.91	0.91	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Carbon Tetrachloride	<	0.49	0.49	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorobenzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorodibromomethane	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroform	<	0.37	0.37	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloromethane	<	0.24	0.24	0.80		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,2-Dichloroethene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dibromomethane	<	0.60	0.60	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dichlorodifluoromethane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Diisopropyl Ether	<	0.76	0.76	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Ethylbenzene		37	0.54	1.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Fluorotrichloromethane	<	0.79	0.79	2.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Hexachlorobutadiene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Isopropylbenzene		4.0	0.59	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methylene Chloride	<	0.43	0.43	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methyl-tert-butyl-ether	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Naphthalene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
N-Butylbenzene	<	0.93	0.93	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B

Pace Analytical Services, Inc.

Analytical Report Number: 859580

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : QC-2

Matrix Type : GROUNDWATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-016

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
n-Propylbenzene		2.0	0.81	2.7		1	ug/L	Q	05/24/05	SW846 5030B	SW846 8260B
p-Isopropyltoluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
sec-Butylbenzene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Styrene	<	0.86	0.86	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
tert-Butylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Tetrachloroethene	<	0.45	0.45	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Toluene		0.94	0.67	2.2		1	ug/L	Q	05/24/05	SW846 5030B	SW846 8260B
trans-1,2-Dichloroethene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Trichloroethene		47	0.48	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Vinyl Chloride	<	0.18	0.18	0.60		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylene, o		2.4	0.83	2.8		1	ug/L	Q	05/24/05	SW846 5030B	SW846 8260B
Xylenes, m + p	<	1.8	1.8	6.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Bromofluorobenzene		85				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Toluene-d8		86				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Dibromofluoromethane		85				1	%Recov		05/24/05	SW846 5030B	SW846 8260B

PAH/ PNA

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene		7.2	0.42	1.4		20	ug/L		05/25/05	SW846 3510C	8270C-SIM
2-Methylnaphthalene	<	0.48	0.48	1.6		20	ug/L		05/25/05	SW846 3510C	8270C-SIM
Acenaphthene		2.9	0.41	1.4		20	ug/L		05/25/05	SW846 3510C	8270C-SIM
Acenaphthylene		2.0	0.41	1.4		20	ug/L		05/25/05	SW846 3510C	8270C-SIM
Anthracene		0.39	0.38	1.3		20	ug/L	Q	05/25/05	SW846 3510C	8270C-SIM
Benzo(a)anthracene		1.5	0.42	1.4		20	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(a)pyrene		1.5	0.39	1.3		20	ug/L		05/25/05	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene		1.2	0.38	1.3		20	ug/L	Q	05/25/05	SW846 3510C	8270C-SIM
Benzo(ghi)perylene		0.88	0.44	1.5		20	ug/L	Q	05/25/05	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene		1.4	0.41	1.4		20	ug/L		05/25/05	SW846 3510C	8270C-SIM
Chrysene		1.9	0.35	1.2		20	ug/L		05/25/05	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	<	0.47	0.47	1.6		20	ug/L		05/25/05	SW846 3510C	8270C-SIM
Fluoranthene		3.4	0.35	1.2		20	ug/L		05/25/05	SW846 3510C	8270C-SIM
Fluorene		0.47	0.46	1.5		20	ug/L	Q	05/25/05	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene		0.68	0.36	1.2		20	ug/L	Q	05/25/05	SW846 3510C	8270C-SIM
Naphthalene		0.54	0.48	1.6		20	ug/L	Q	05/25/05	SW846 3510C	8270C-SIM
Phenanthrene		1.2	0.43	1.4		20	ug/L	Q	05/25/05	SW846 3510C	8270C-SIM
Pyrene		3.7	0.35	1.2		20	ug/L		05/25/05	SW846 3510C	8270C-SIM
Nitrobenzene-d5		0				20	%Recov	D	05/25/05	SW846 3510C	8270C-SIM
2-Fluorobiphenyl		0				20	%Recov	D	05/25/05	SW846 3510C	8270C-SIM
Terphenyl-d14		0				20	%Recov	D	05/25/05	SW846 3510C	8270C-SIM

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 859580

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : TB

Matrix Type : WATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-017

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1,1,1,2-Tetrachloroethane	<	0.92	0.92	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,1-Trichloroethane	<	0.90	0.90	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2,2-Tetrachloroethane	<	0.20	0.20	0.67		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1,2-Trichloroethane	<	0.42	0.42	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethane	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloroethene	<	0.57	0.57	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,1-Dichloropropene	<	0.75	0.75	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichlorobenzene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,3-Trichloropropane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trichlorobenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2,4-Trimethylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromo-3-chloropropane	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dibromoethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichlorobenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloroethane	<	0.36	0.36	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,2-Dichloropropane	<	0.46	0.46	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3,5-Trimethylbenzene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichlorobenzene	<	0.87	0.87	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,3-Dichloropropane	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
1,4-Dichlorobenzene	<	0.95	0.95	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2,2-Dichloropropane	<	0.62	0.62	2.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
2-Chlorotoluene	<	0.85	0.85	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Chlorotoluene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Benzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromobenzene	<	0.82	0.82	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromochloromethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromodichloromethane	<	0.56	0.56	1.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromoform	<	0.94	0.94	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Bromomethane	<	0.91	0.91	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Carbon Tetrachloride	<	0.49	0.49	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorobenzene	<	0.41	0.41	1.4		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chlorodibromomethane	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroethane	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloroform	<	0.37	0.37	1.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Chloromethane	<	0.24	0.24	0.80		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,2-Dichloroethene	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
cis-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dibromomethane	<	0.60	0.60	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Dichlorodifluoromethane	<	0.99	0.99	3.3		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Diisopropyl Ether	<	0.76	0.76	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Ethylbenzene	<	0.54	0.54	1.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Fluorotrichloromethane	<	0.79	0.79	2.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Hexachlorobutadiene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Isopropylbenzene	<	0.59	0.59	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Methylene Chloride		0.58	0.43	1.4		1	ug/L	Q	05/24/05	SW846 5030B	SW846 8260B
Methyl-tert-butyl-ether	<	0.61	0.61	2.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Naphthalene	<	0.74	0.74	2.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
N-Butylbenzene	<	0.93	0.93	3.1		1	ug/L		05/24/05	SW846 5030B	SW846 8260B

Pace Analytical Services, Inc.

1241 Bellevue Street
Green Bay, WI 54302
920-469-2436

Analytical Report Number: 859580

Client : NATURAL RESOURCE TECHNOLOGY
Project Name : WPSC - MANITOWOC
Project Number : 1530
Field ID : TB

Matrix Type : WATER
Collection Date : 05/18/05
Report Date : 05/31/05
Lab Sample Number : 859580-017

VOLATILES

Prep Date: 05/24/05

Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
n-Propylbenzene	<	0.81	0.81	2.7		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
p-Isopropyltoluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
sec-Butylbenzene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Styrene	<	0.86	0.86	2.9		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
tert-Butylbenzene	<	0.97	0.97	3.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Tetrachloroethene	<	0.45	0.45	1.5		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Toluene	<	0.67	0.67	2.2		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,2-Dichloroethene	<	0.89	0.89	3.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
trans-1,3-Dichloropropene	<	0.19	0.19	0.63		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Trichloroethene	<	0.48	0.48	1.6		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Vinyl Chloride	<	0.18	0.18	0.60		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylene, o	<	0.83	0.83	2.8		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
Xylenes, m + p	<	1.8	1.8	6.0		1	ug/L		05/24/05	SW846 5030B	SW846 8260B
4-Bromofluorobenzene		84				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Toluene-d8		86				1	%Recov		05/24/05	SW846 5030B	SW846 8260B
Dibromofluoromethane		85				1	%Recov		05/24/05	SW846 5030B	SW846 8260B

Qualifier Codes

Flag	Applies To	Explanation
A	Inorganic	Analyte is detected in the method blank. Method blank criteria is evaluated to the laboratory method detection limit. Additionally, method blank acceptance may be based on project specific criteria or determined from analyte concentrations in the sample and are evaluated on a sample by sample basis.
B	Inorganic	The analyte has been detected between the method detection limit and the reporting limit.
B	Organic	Analyte is present in the method blank. Method blank criteria is evaluated to the laboratory method detection limit. Additionally, method blank acceptance may be based on project specific criteria or determined from analyte concentrations in the sample and are evaluated on a sample by sample basis.
C	All	Elevated detection limit.
D	All	Analyte value from diluted analysis or surrogate result not applicable due to sample dilution.
E	Inorganic	Estimated concentration due to matrix interferences. During the metals analysis the serial dilution failed to meet the established control limits of 0-10%. The sample concentration is greater than 50 times the IDL for analysis done on the ICP or 100 times the IDL for analysis done on the ICP-MS. The result was flagged with the E qualifier to indicate that a physical interference was observed.
E	Organic	Analyte concentration exceeds calibration range.
F	Inorganic	Due to potential interferences for this analysis by Inductively Coupled Plasma techniques (SW-846 Method 6010), this analyte has been confirmed by and reported from an alternate method.
F	Organic	Surrogate results outside control criteria.
G	All	The result is estimated because the concentration is less than the lowest calibration standard concentration utilized in the initial calibration. The method detection limit is less than the reporting limit specified for this project.
H	All	Preservation, extraction or analysis performed past holding time.
HF	Inorganic	This test is considered a field parameter, and the recommended holding time is 15 minutes from collection. The analysis was performed in the laboratory beyond the recommended holding time.
J	All	Concentration detected equal to or greater than the method detection limit but less than the reporting limit.
K	Inorganic	Sample received unpreserved. Sample was either preserved at the time of receipt or at the time of sample preparation.
K	Organic	Detection limit may be elevated due to the presence of an unrequested analyte.
L	All	Elevated detection limit due to low sample volume.
M	Organic	Sample pH was greater than 2
N	All	Spiked sample recovery not within control limits.
O	Organic	Sample received overweight.
P	Organic	The relative percent difference between the two columns for detected concentrations was greater than 40%.
Q	All	The analyte has been detected between the limit of detection (LOD) and limit of quantitation (LOQ). The results are qualified due to the uncertainty of analyte concentrations within this range.
S	Organic	The relative percent difference between quantitation and confirmation columns exceeds internal quality control criteria. Because the result is unconfirmed, it has been reported as a non-detect with an elevated detection limit.
T	All	Inadequate sample volume received to perform the method required MS/MSD.
U	All	The analyte was not detected at or above the reporting limit.
V	All	Sample received with headspace.
W	All	A second aliquot of sample was analyzed from a container with headspace.
X	All	See Sample Narrative.
&	All	Laboratory Control Spike recovery not within control limits.
*	All	Precision not within control limits.
<	All	The analyte was not detected at or above the reporting limit.
1	Inorganic	Dissolved analyte or filtered analyte greater than total analyte; analyses passed QC based on precision criteria.
2	Inorganic	Dissolved analyte or filtered analyte greater than total analyte; analyses failed QC based on precision criteria.
3	Inorganic	BOD result is estimated due to the BOD blank exceeding the allowable oxygen depletion.
4	Inorganic	BOD duplicate precision not within control limits. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
5	Inorganic	BOD result is estimated due to insufficient oxygen depletion. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
6	Inorganic	BOD laboratory control sample not within control limits. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
7	Inorganic	BOD result is estimated due to complete oxygen depletion. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.

Analysis Summary by Laboratory

1241 Bellevue Street
Green Bay, WI 54302

Test Group Name	859580-001	859580-002	859580-003	859580-004	859580-005	859580-006	859580-007	859580-008	859580-009	859580-010	859580-011	859580-012	859580-013	859580-014	859580-015	859580-016	859580-017
PAH/ PNA	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
VOLATILES	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

Code	Facility	Address	WI Certification
B	Green Bay Lab (Bellevue St)	1241 Bellevue Street, Suite 9 Green Bay, WI 54302	405132750 / DATCP: 105-444
G	Green Bay Lab (Industrial Dr)	1795 Industrial Drive Green Bay, WI 54302	405132750

En Chem, Inc. Cooler Receipt Log

Batch No. 859580

Project Name or ID WPSC-Manitowoc No. of Coolers: 3 Temps: R01

A. Receipt Phase: Date cooler was opened: 5-20-05 **By:** AB

1: Were samples received on ice? (Must be ≤ 6 C) .... YES NO[2] NA

2. Was there a Temperature Blank? .... YES NO

3: Were custody seals present and intact on cooler? (Record on COC) .... YES NO

4: Are COC documents present? .... YES NO[2]

5: Does this Project require quick turn around analysis? .... YES NO

6: Is there any sub-work? .... YES NO

7: Are there any short hold time tests? .... YES NO

8: Are any samples nearing expiration of hold-time? (Within 2 days) .... YES[1] NO Contacted by/Who______

9: Do any samples need to be Filtered or Preserved in the lab? .... YES[1] NO Contacted by/Who______

B. Check-in Phase: Date samples were Checked-in: 5-20-05 **By:** AB

1: Were all sample containers listed on the COC received and intact? .... YES NO[2] NA

2: Sign the COC as received by En Chem. Completed .... YES NO

3: Do sample labels match the COC? .... YES NO[2]

4: Completed pH check on preserved samples. .... YES NO NA
(This statement does not apply to water: VOC, O&G, TOC, DRO, Total Rec. Phenolics)

5: Do samples have correct chemical preservation? .... YES NO[2] NA
(This statement does not apply to water: VOC, O&G, TOC, DRO, Total Rec. Phenolics)

6: Are dissolved parameters field filtered? .... YES NO[2] NA

7: Are sample volumes adequate for tests requested? .... YES NO[2]

8: Are VOC samples free of bubbles >6mm .... YES NO[2] NA

9: Enter samples into logbook. Completed .... YES NO

10: Place laboratory sample number on all containers and COC. Completed .... YES NO

11: Complete Laboratory Tracking Sheet (LTS). Completed .... YES NO NA

12: Start Nonconformance form. .... YES NO NA

13: Initiate Subcontracting procedure. Completed .... YES NO NA

14: Check laboratory sample number on all containers and COC. .... C/5/20 YES NO NA

Short Hold-time tests:

24 Hours or less	48 Hours	7 days	Footnotes
Coliform	BOD	Ash	1 Notify proper lab group immediately.
Corrosivity = pH	Color	~~Aqueous Extractable Organics- ALL~~	2 Complete nonconformance memo.
Dissolved Oxygen	Nitrite or Nitrate	Flashpoint	
Hexavalent Chromium	Ortho Phosphorus	Free Liquids	
HPC	Surfactants	Sulfide	
Ferrous Iron	Turbidity	TDS	
Eh	En Core Preservation	TSS	
Odor	Power stop preservation	Total Solids	
Residual Chlorine		TVS	
Sulfite		TVSS	
		Unpreserved VOC's	

Rev. 2/05/04, Attachment to 1-REC-5.
Subject to QA Audit.

Reviewed by/date TMT 5/23/05

v4

(Please Print Legibly)
Company Name: Natural Resource Technology
Branch or Location: Pewaukee
Project Contact: Eric Tlachac, Richard Weber
Telephone: 262-523-9000
Project Number: 1530
Project Name: WPSC - Manitowoc
Project State: Wisconsin
Sampled By (Print): Randy Barnhill
PO #:

EN CHEM INC.

1241 Bellevue St., Suite 9
Green Bay, WI 54302
920-469-2436
Fax 920-469-8827

A Division of Pace Analytical Services, Inc.

CHAIN OF CUSTODY No. 131472

Page 1 of 2
Quote #:
Mail Report To: Rich Weber
Company: N.RT
Address: 23713 W. Paul Rd
Pewaukee, WI
Invoice To:
Company:
Address:
Mail Invoice To:

*Preservation Codes
A=None B=HCL C=H2SO4 D=HNO3 E=EnCore F=Methanol G-NaOH
H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

Data Package Options - (please circle if requested
Sample Results Only (no QC)
EPA Level II (Subject to Surcharge)
EPA Level III (Subject to Surcharge)
EPA Level IV (Subject to Surcharge)

Regulatory Program: UST, RCRA, SDWA, NPDES, CERCLA

Matrix Codes: GW=Ground Water, W=Water, S=Soil, A=Air, C=Charcoal, B=Biota, Sl=Sludge, WP=Wipe

ANALYSES REQUESTED: VOC's, PAH's
FILTERED? (YES/NO): No, No
PRESERVATION (CODE)*: B, A

LABORATORY ID (Lab Use Only)	FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	VOC's	PAH's						TOTAL # OF BOTTLES SENT	CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)
001	MW-1	5-18-05	1400	GW	X	X						4	1-1L amber A, 3-40ml B	
002	MW-2		1350		X	X						4		
003	MW-5		1410		X	X						4		
004	MW-8		1200		X	X						4		
005	MW-9		1210		X	X						4		
006	MW-10		1220		X	X						4		
007	MW-12		1240		X	X						4		
008	MW-12D		1250		X	X						4		
009	MW-13		1230		X	X						4		
010	MW-17T		1320		X	X						4		
011	MW-18T		1340		X	X						4		
012	MW-19T	5-18-05	1300	GW	X	X						4		

Rush Turnaround Time Requested (TAT) - Prelim
(Rush TAT subject to approval/surcharge)
Date Needed:
Transmit Prelim Rush Results by (circle):
Phone Fax E-mail
Phone #:
Fax #:
E-Mail Address:

Samples on HOLD are subject to special pricing and release of liability

Relinquished By:	Date/Time:	Received By:	Date/Time:
Randy Barnhill	5-20-05	Bill Nottemeyer	5/20/05 1000
Bill Nottemeyer	5/20/05 1200	Hague	5-20-05 1200
Hague	5-20-05 1415	Ashley Busky	5-20-05 1415

En Chem Project No. 859580
Sample Receipt Temp. R01
Sample Receipt pH (Wet/Metals) NA
Cooler Custody Seal
Present / Not Present
Intact / Not intact

Version 4.0: 09/04

(Please Print Legibly)
Company Name: Natural Resource Technology
Branch or Location: Pewaukee
Project Contact: Eric Nachac, Richard Weber
Telephone: 262-523-9000
Project Number: 1530
Project Name: WPSC - Manitowoc
Project State: Wisconsin
Sampled By (Print): Randy Barnhill
PO #:

EN CHEM INC.

A Division of Pace Analytical Services, Inc.

1241 Bellevue St., Suite 9
Green Bay, WI 54302
920-469-2436
Fax 920-469-8827

CHAIN OF CUSTODY No.131473

Page 2 of 2
Quote #:
Mail Report To: Richard Weber
Company: N.R.T.
Address: 23713 W. Paul Rd.
Pewaukee, WI
Invoice To:
Company:
Address:
Mail Invoice To:

*Preservation Codes
A=None B=HCL C=H2S04 D=HNO3 E=EnCore F=Methanol G-NaOH
H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

FILTERED? (YES/NO): NO | NO
PRESERVATION (CODE)*: B | A

Data Package Options - (please circle if requested
Sample Results Only (no QC)
EPA Level II (Subject to Surcharge)
EPA Level III (Subject to Surcharge)
EPA Level IV (Subject to Surcharge)

Regulatory Program: UST, RCRA, SDWA, NPDES, CERCLA

Matrix Codes: GW=Ground Water, W=Water, S=Soil, A=Air, C=Charcoal, B=Biota, Sl=Sludge, WP=Wipe

ANALYSES REQUESTED

LABORATORY ID (Lab Use Only)	FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	VOC'S	PAH'S						TOTAL # OF BOTTLES SENT	CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)
013	MW-20T	5-18-05	1330	GW	X	X						4	1-1L amber[A],	3-40 ml[B]
014	MW-21T	|	1310	|	X	X						4		
015	QC-1	|	—	|	X	X						4		
016	QC-2	|	—	|	X	X						4		
017	TB	5-18-05	—	GW	X							2	2-40 ml	TB[B]

Rush Turnaround Time Requested (TAT) - Prelim
(Rush TAT subject to approval/surcharge)
Date Needed:
Transmit Prelim Rush Results by (circle):
Phone Fax E-mail
Phone #:
Fax #:
E-Mail Address:

Samples on HOLD are subject to special pricing and release of liability

Relinquished By:	Date/Time:	Received By:	Date/Time:
Randy Barnhill	5/20/05 1000	Bill Noltemeyer	5/20/05 1000
Bill Noltemeyer	5/20/05 1200	Hague	5-20-05 1200
Hague	5-20-05 1415	Ashley Busky	5-20-05 1415

En Chem Project No. 859580
Sample Receipt Temp. RO1
Sample Receipt pH (Wet/Metals) NA
Cooler Custody Seal
Present / Not Present
Intact / Not intact

Version 4.0: 09/04

APPENDIX G2

TREATMENT SYSTEM ANALYTICAL SUMMARY TABLES

Table 6 - Pretreatment System Analytical Results - Influent, Intermediate, and Effluent
Wisconsin Public Service - Manitowoc Former Fuel & Light Manufactured Gas Plant Site
402 N. Tenth Street, Manitowoc, Wisconsin
USEPA ID# WIN000509949

		BTEX Compounds (µg/L)					Additional Volatile Organic Compounds (VOCs, µg/L)								SVOCs (µg/L)							
Sample ID	Collect Date	Benzene	Toluene	Ethylbenzene	Xylene, Total	Total BTEX	cis-1,2-Dichloroethene	1,1-Dichloroethane	Isopropyl-benzene	Methyl Tertiary Butyl Ether	n-Propylbenzene	Styrene	Trimethylbenzenes	Trichloroethene	Acenaphthylene	Anthracene	Fluorene	Phenanthrene	2,4-Dimethylphenol	1-Methylnapthalene	2-Methylnaphthalene	Naphthalene
Influent (PW-1)	10/28/1997	420	260	150	290	1120	--	--	--	<250	--	--	71	--	nd	--	--	--	29	--	nd	420
	11/12/1997	750	420	510	550	2230	--	--	--	nd	--	--	nd	--	30	--	--	--	60	--	66	2200
	11/13/1997	420	190	290	360	1260	--	--	--	nd	--	--	nd	--	22	--	--	--	nd	--	nd	1600
	11/20/1997	190	98	140	170	598	--	--	--	nd	--	--	55.2	--	7	--	--	--	nd	--	11	470
	11/25/1997	140	73	93	120	426	--	--	--	nd	--	--	33.2	--	nd	--	--	--	nd	--	nd	400
	12/4/1997	160	110	140	160	570	--	--	--	<250	--	--	<1.0	--	9	--	--	--	nd	--	nd	640
	12/9/1997	200	140	180	200	720	--	--	--	<50	--	--	<1.0	--	9	--	--	--	nd	--	nd	640
	1/15/1998	170	190	120	220	700	--	--	--	<50	--	--	60	--	--	--	--	--	--	--	--	--
	2/17/1998	110	110	74	160	454	--	--	--	<50	--	--	39.4	--	--	--	--	--	--	--	--	--
	3/11/1998	<1.0	<1.0	<1.0	<3.0	nd	--	--	--	<50	--	--	<1.0	--	--	--	--	--	--	--	--	--
	4/14/1998	94	100	72	170	436	--	--	--	<50	--	--	33.3	--	--	--	--	--	--	--	--	--
	5/19/1998	31	1.8	<1.0	7.6	40.4	--	--	--	<50	--	--	<1.0	--	--	--	--	--	--	--	--	--
	6/11/1998	100	120	74	170	464	--	--	--	<50	--	--	38.2	--	--	--	--	--	--	--	--	--
	1/12/1999	90	99	72	240	501	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	9/14/2001	47	52	47	150	296	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	4/23/2002	50	65	61	121	297	0.86 Q	<0.48	4.4	<0.67	1.8 Q	42	28.6	27	7.3 Q	--	--	--	<5.2	--	10 Q	210
	10/8/2002	46	66	43	124	279	<4.0	<4.3	<3.3	<4.3	<4.8	41 &	32.8	31	<10	--	--	--	<10	--	16 Q	380
	4/16/2003	44	59	56	108	267	<4.2	<3.8	4.1 Q	<3.0	<4.0	36	29.1 Q	39	<19	<11	<19	<8.4	<12	--	<16	310
	10/17/2003	48	63	65	111	287	<4.2	<3.8	4.4 Q	<3.0	<4.0	37	30.9 Q	36	<19	<20	<17	<16	--	22 Q	<17	310
	5/24/2004	35	38	43	75	191	<4.1	<2.8	3.5 Q	<3.0	<4.1	16	13 Q	40	5.4 Q D*	0.020 Q *	0.22	0.082	--	16 D	5.7 Q D*	170 D
	11/10/2004	38	30	37	118	223	2.5 Q	<1.5	6.8	<1.2	2.0 Q	<1.7	21 Q	54	4.3 Q	<1.8	<2.2	<2.0	--	18	4.1 Q	190 D
	5/18/2005	33	47	58	98	236	<4.1	<3.8	4.2 Q	<3.0	<4.1	27	27 Q	36	2.6 Q	<1.8	<2.2	<2.0	--	17	6.2 Q	30
	11/28/2005	38	44	58	95	235	4.1 Q	<1.9	3.4 Q	<1.5	<2.0	24	23 Q	40	5.5 QD	0.021 Q	0.29	0.17	--	18 D	6.0 QD	240 D
	5/30/2006	43	28	48	72	191	3.3	<0.75	7.4	<0.61	2.2 Q	<0.86	<0.97	52	<3.2	<4.6	<3.6	<4.5	--	10 Q	<4.5	120

Table 6 - Pretreatment System Analytical Results - Influent, Intermediate, and Effluent
Wisconsin Public Service - Manitowoc Former Fuel & Light Manufactured Gas Plant Site
402 N. Tenth Street, Manitowoc, Wisconsin
USEPA ID# WIN000509949

		BTEX Compounds (µg/L)					Additional Volatile Organic Compounds (VOCs, µg/L)								SVOCs (µg/L)							
Sample ID	Collect Date	Benzene	Toluene	Ethylbenzene	Xylene, Total	Total BTEX	cis-1,2-Dichloroethene	1,1-Dichloroethane	Isopropyl-benzene	Methyl Tertiary Butyl Ether	n-Propylbenzene	Styrene	Trimethylbenzenes	Trichloroethene	Acenaphthylene	Anthracene	Fluorene	Phenanthrene	2,4-Dimethylphenol	1-Methylnapthalene	2-Methylnaphthalene	Naphthalene
Intermediate	07/13/1998	68	16	<1.0	42	126	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/24/1998	75	20	<1.0	85	180	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	09/22/1998	72	17	<1.0	120	209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/02/1998	<1.0	<1.0	<1.0	<3.0	nd	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/23/1998	6.6	<1.0	<1.0	<3.0	6.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/16/1998	14	2.6	<1.0	6	22.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	01/12/1999	38	3	<1.0	19	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/11/1999	56	6.2	<1.0	32	94	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/24/1999	64	11	<1.0	57	132	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	09/14/2001	<1.0	<1.0	<1.0	<3.0	nd	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	04/23/2002	48	<0.82	4.6	40	93	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	06/24/2002	58	16	<0.82	55	129	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/26/2002	60	14	<0.82	83	157	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/08/2002	55	16	1.8 Q	95	168	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	06/09/2003	13	2.3	<0.6	11.9	27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/17/2003	41	11	<0.6	52	104	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/29/2003	44	8.7	0.79 Q	52	105	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	04/29/2004	<0.14	<0.36	<0.40	<0.74	nd	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	06/30/2004	2.3	1.2	1.4	4.3	9.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/25/2004	3.3	1.3	1.0 Q	3.9 Q	9.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/28/2004	21	5.7	1.3	22.9	50.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/16/2005	40	29	6.8	75	150.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	04/14/2005	40	8.6	4.6	55	108.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	06/16/2005	40	3.8	<0.4	64	107.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/10/2005	43	14	11	83	151	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/17/2005	43	9.9	4.6	84	141.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/20/2005	41	24	31	99	195	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/20/2006	39	17	18	75	149	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	04/26/2006	37	23	23	85	168	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/08/2006	35	16	19	63	133	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 6 - Pretreatment System Analytical Results - Influent, Intermediate, and Effluent
Wisconsin Public Service - Manitowoc Former Fuel & Light Manufactured Gas Plant Site
402 N. Tenth Street, Manitowoc, Wisconsin
USEPA ID# WIN000509949

		BTEX Compounds (µg/L)					Additional Volatile Organic Compounds (VOCs, µg/L)								SVOCs (µg/L)							
Sample ID	Collect Date	Benzene	Toluene	Ethylbenzene	Xylene, Total	Total BTEX	cis-1,2-Dichloroethene	1,1-Dichloroethane	Isopropyl-benzene	Methyl Tertiary Butyl Ether	n-Propylbenzene	Styrene	Trimethylbenzenes	Trichloroethene	Acenaphthylene	Anthracene	Fluorene	Phenanthrene	2,4-Dimethylphenol	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene
		City of Manitowoc Effluent Water Standards (µg/l)																				
		125	ne	ne	ne	250	ne	ne	ne	ne	ne	ne	ne	ne	nd	nd	nd	nd	ne	nd	nd	nd
Effluent	10/28/1997	<1.0	<1.0	<1.0	<30.	nd	--	--	--	<50	--	--	<1.0	--	nd	--	--	--	nd	--	nd	nd
	11/12/1997	<1.0	<1.0	<1.0	<3.0	nd	--	--	--	<50	--	--	<1.0	--	nd	--	--	--	nd	--	nd	nd
	11/13/1997	<1.0	<1.0	<1.0	<3.0	nd	--	--	--	<50	--	--	<1.0	--	nd	--	--	--	nd	--	nd	nd
	11/20/1997	<1.0	<1.0	<1.0	<3.0	nd	--	--	--	<50	--	--	<1.0	--	nd	--	--	--	nd	--	nd	nd
	11/25/1997	<1.0	<1.0	<1.0	<3.0	nd	--	--	--	<50	--	--	<1.0	--	nd	--	--	--	nd	--	nd	nd
	12/04/1997	<1.0	<1.0	<1.0	<3.0	nd	--	--	--	<50	--	--	<1.0	--	nd	--	--	--	nd	--	nd	nd
	12/09/1997	<1.0	<1.0	<1.0	<3.0	nd	--	--	--	<50	--	--	<1.0	--	nd	--	--	--	nd	--	nd	nd
	01/15/1998	<1.0	<1.0	<1.0	<3.0	nd	--	--	--	<50	--	--	<1.0	--	--	--	--	--	--	--	--	--
	02/17/1998	1.1	1.0	<1.0	<3.0	nd	--	--	--	<50	--	--	<1.0	--	--	--	--	--	--	--	--	--
	03/11/1998	<1.0	<1.0	<1.0	<3.0	nd	--	--	--	<50	--	--	<1.0	--	--	--	--	--	--	--	--	--
	04/14/1998	<1.0	<1.0	<1.0	<3.0	nd	--	--	--	<50	--	--	<1.0	--	--	--	--	--	--	--	--	--
	05/19/1998	<1.0	<1.0	<1.0	<3.0	nd	--	--	--	<50	--	--	<1.0	--	--	--	--	--	--	--	--	--
	06/11/1998	<1.0	<1.0	<1.0	<3.0	nd	--	--	--	<50	--	--	<1.0	--	--	--	--	--	--	--	--	--
	07/13/1998	<1.0	<1.0	<1.0	<3.0	nd	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/24/1998	<1.0	<1.0	<1.0	<3.0	nd	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	09/22/1998	2.7	<1.0	<1.0	<3.0	2.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/02/1998	<1.0	<1.0	<1.0	<3.0	nd	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/23/1998	<1.0	<1.0	<1.0	<3.0	nd	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/16/1998	<1.0	<1.0	<1.0	<3.0	nd	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	01/12/1999	<1.0	<1.0	<1.0	<3.0	nd	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	02/11/1999	<1.0	<1.0	<1.0	<1.0	nd	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/24/1999	3.9	<1.0	<1.0	<3.0	3.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	09/14/2001	9.7	<1.0	<1.0	<3.0	9.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	04/23/2002	4.4	<0.47	<0.43	<1.4	4.4	<0.73	<0.48	<0.43	0.68 Q	<0.64	<0.43	<0.60	0.94 Q	<2.6	--	--	--	<2.6	--	<2.6	<2.7
	10/8&14/02	22	<0.84	<0.53	2.0 Q	24	0.88 Q	<0.87	<0.66	1.0 Q	<0.95	<0.62 &	<0.69	7.0	<2.6	--	--	--	<2.6	--	<2.6	<2.7
	04/16/2003	<0.41	<0.67	<0.54	<1.8	nd	<0.83	<0.75	<0.59	<0.61	<0.81	<0.86	<0.97	<0.48	<4.7	<2.8	<4.7	<2.1	<2.9	--	<3.9	<3.8
	10/17/2003	0.92 Q	<0.67	<0.54	<1.8	0.92	<0.83	<0.75	<0.59	<0.61	<0.81	<0.86	<0.97	<0.48	<4.7	<2.8	<4.7	<2.1	<2.9	--	<3.9	<3.8
	05/24/2004	<0.41	<0.67	<0.54	<1.8	nd	<0.83	<0.75	<0.59	<0.61	<0.81	<0.86	<0.97	<0.48	<4.4	<2.6	<4.4	<2.0	<2.8	--	<3.7	<3.6

Table 6 - Pretreatment System Analytical Results - Influent, Intermediate, and Effluent
Wisconsin Public Service - Manitowoc Former Fuel & Light Manufactured Gas Plant Site
402 N. Tenth Street, Manitowoc, Wisconsin
USEPA ID# WIN000509949

		BTEX Compounds (µg/L)					Additional Volatile Organic Compounds (VOCs, µg/L)								SVOCs (µg/L)							
Sample ID	**Collect Date**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylene, Total**	**Total BTEX**	**cis-1,2-Dichloroethene**	**1,1-Dichloroethane**	**Isopropyl-benzene**	**Methyl Tertiary Butyl Ether**	**n-Propylbenzene**	**Styrene**	**Trimethylbenzenes**	**Trichloroethene**	**Acenaphthylene**	**Anthracene**	**Fluorene**	**Phenanthrene**	**2,4-Dimethylphenol**	**1-Methylnapthalene**	**2-Methylnaphthalene**	**Naphthalene**
City of Manitowoc Effluent Water Standards (µg/l)																						
		125	ne	ne	ne	250	ne	ne	ne	ne	ne	ne	ne	ne	nd	nd	nd	nd	ne	nd	nd	nd
Effluent (cont)	11/10/2004	<0.41	<0.67	<0.54	<1.8	nd	<0.83	<0.75	<0.59	<0.61	<0.81	<0.86	<0.97	<0.48	<0.50	<1.6	<0.50	<0.50	<0.72	--	<1.9	<0.6
	02/16/2005	1.2	<0.36	<0.40	<0.74	1.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/18/2005	10	<0.67	<0.54	<1.8	10	2.4 Q	<0.75	<0.59	<0.61	<0.81	<0.86	<0.97	6.1	<0.50	<1.6	<0.50	<0.50	<0.72	--	<1.9	<0.60
	11/28/2005	26	<0.67	<0.54	<1.8	26	4.9	<0.75	<0.59	<0.61	<0.81	<0.86	<0.97	16	<1.1	<0.82	<0.88	<0.72	<0.65	--	<1.6	<1.4
	05/30/2006	29	<0.67	<0.54	<1.8	29	6.0	<0.75	<0.59	<0.61	<0.81	<0.86	<0.97	18	<1.0	<0.77	<0.83	<0.68	<0.72	--	<1.5	<1.3

[JTB/LJH - 09/03][JAZ-10/03][JKY/SAG - 7/04][JKY-10/04][EJT/HMS - 9/05][HMS/RJG 06/06]

Notes:

1) Pre-2002 data from Horizon Environmental reports. Possible Data missing.
2) Trimethylbenzenes include 1,2,4- and 1,3,5-trimethylbenzene
3) Only detected compounds shown. Laboratory report should be referenced for full list of analytes.
4) Analytes attaining or exceeding the Preventive Action Limit (PAL) are shown in italics.
5) Analytes attaining or exceeding the Enforcement Standard (ES) are shown in bold.
D: Analyte value from diluted analysis or surrogate result not applicable due to sample dilution.
Q: Analyte detected between the limit of detection (LOD) and limit of quantitation (LOQ).
&: Laboratory Control Spike recovery not within control limits.
ne: City of Manitowoc effluent water standard not established.
nd: Analyte not detected.
--: Not Analyzed or unknown if analyzed

Table 8 - Pretreatment System Analytical Summary for WWTP
Wisconsin Public Service - Manitowoc Former Fuel & Light Manufactured Gas Plant Site
402 N. Tenth Street, Manitowoc, Wisconsin
USEPA ID# WIN000509949

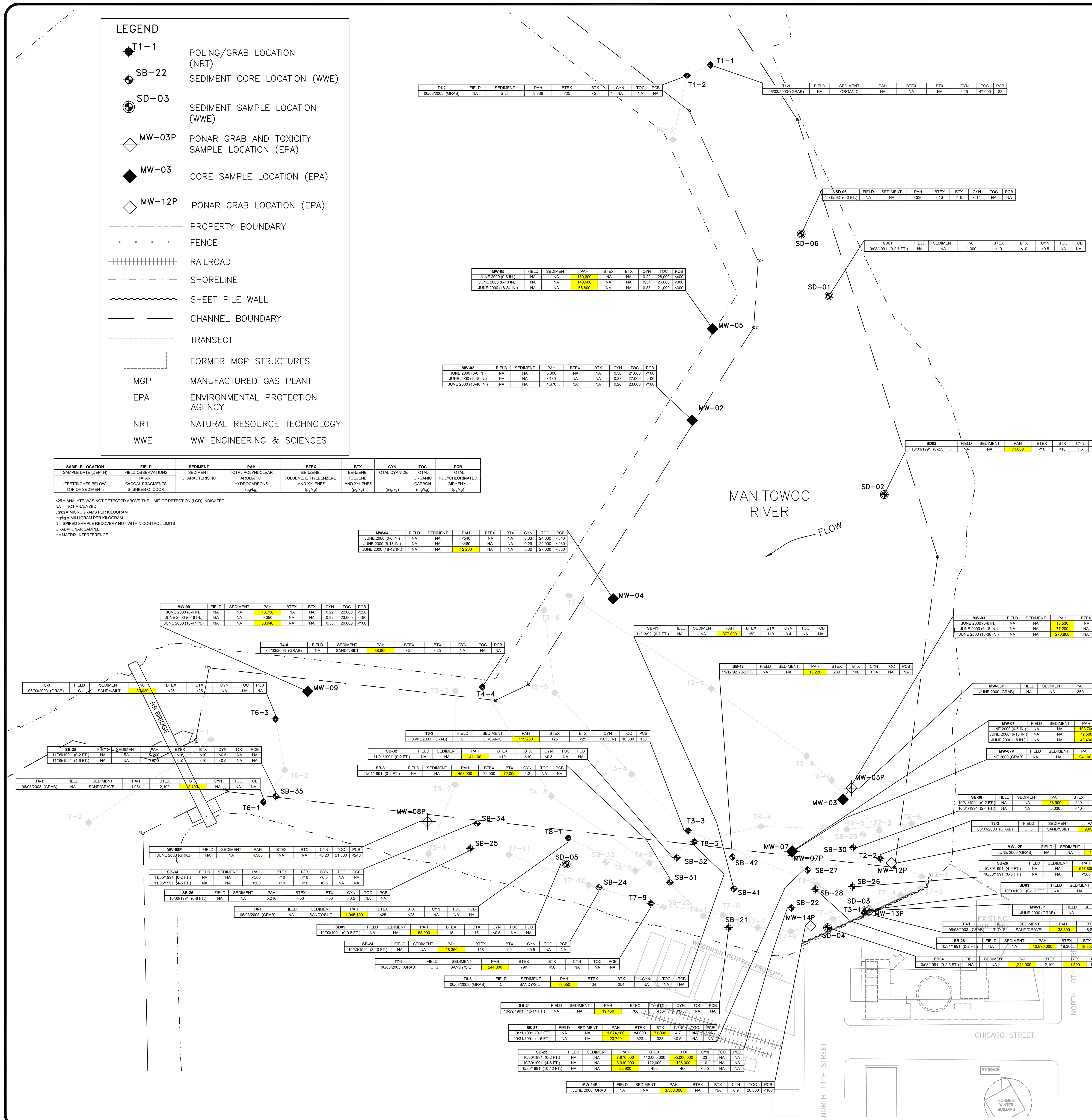
Parameter	Unit	April 2002		October 2002		April 2003		October 2003		May 2004		November 2004		May 2005		November 2005		May 2006		Effluent Limit
		influent	effluent	influent	effluent	influent	effluent	influent	effluent	influent	effluent	influent	effluent	influent	effluent	influent	effluent	influent	effluent	
Arsenic	mg/L	0.0025	0.00067 Q	0.0028 Q	<DL	<DL	<DL	--	--	--	--	--	--	--	--	--	--	--	--	**NL**
Barium	mg/L	0.089	0.091	0.088	<DL	0.093	0.094	--	--	--	--	--	--	--	--	--	--	--	--	**NL**
Cadmium	mg/L	<DL	<DL	<DL	<DL	<DL	<DL	--	--	--	--	--	--	--	--	--	--	--	--	**NL**
Chromium	mg/L	<DL	0.00056 Q	<DL	<DL	<DL	<DL	--	--	--	--	--	--	--	--	--	--	--	--	**NL**
Copper	mg/L	0.0032	0.0028	<DL	<DL	0.0024 Q	0.0013 Q	--	--	--	--	--	--	--	--	--	--	--	--	**NL**
Lead	mg/L	<DL	<DL	<DL	<DL	<DL	<DL	--	--	--	--	--	--	--	--	--	--	--	--	**NL**
Mercury	mg/L	<DL	<DL	<DL	<DL	<DL	<DL	--	--	--	--	--	--	--	--	--	--	--	--	**NL**
Molybdenum	mg/L	0.0012 Q	0.0013 Q	<DL	<DL	<DL	<DL	--	--	--	--	--	--	--	--	--	--	--	--	**NL**
Nickel	mg/L	0.0073	0.012	<DL	0.025 Q	0.0036 Q	0.038	--	--	--	--	--	--	--	--	--	--	--	--	**NL**
Selenium	mg/L	0.0024	0.00088 Q	<DL	<DL	<DL	<DL	--	--	--	--	--	--	--	--	--	--	--	--	**NL**
Silver	mg/L	<DL	<DL	<DL	<DL	<DL	<DL	--	--	--	--	--	--	--	--	--	--	--	--	**NL**
Zinc	mg/L	0.031	0.01	0.076	<DL	0.026	0.0048 Q	--	--	--	--	--	--	--	--	--	--	--	--	**NL**
Cyanide, total	mg/L	0.046	0.049	0.059	0.052	0.042	0.041	--	--	--	--	--	--	--	--	--	--	--	--	**NL**
Cyanide, amen.	mg/L	0.046	0.046	0.059	0.052	0.042	0.041	--	--	--	--	--	--	--	--	--	--	--	--	**NL**
pH	std	7.3	7.3	7.2	7.2	6.7	6.7	--	7.5	--	7.0	--	7.1	--	7.33	--	7.3	--	6.9	**5.0 - 10.5**
Oil & Grease	mg/L	<DL	1.2 Q	3.4 Q	1.2 Q	<DL	<DL	--	--	--	--	--	--	--	--	--	<5.0	--	--	**NL**
Benzene	ug/L	50	4.4	46	22	44	<DL	48	0.92 Q	35	<DL	38	<DL	33	10	38	26	43	29	**125**
Total BTEX (7)	ug/L	297	4.4	279	24	267	<DL	287	0.92 Q	191	<DL	223	<DL	236	10	235	26	191	29	**250**
TPH (8)	ug/L	2500	<DL	2600	67	2400	<DL	--	--	--	--	--	--	--	--	--	--	--	--	**NL**
Total PAH (9)	ug/L	227.3 Q	<DL	396 Q	<DL	310	<DL	332 Q	<DL	197 Q*D	<DL	216 QD	<DL	56 Q	<DL	270 QD	<DL	130 Q	<DL	**<DL**

[EJT/PAR-8/05]

Notes:
1) Q = compound detected above the method detection limit but below the method quantitation limit.
2) * = precision not within control limits
3) D = analyte value from diluted analysis or surrogate result not applicable due to sample dilution
4) NL = No Limit
5) <DL = less than detection limit
6) -- = Not Analyzed
7) parameter is the sum of the following compounds: benzene, toluene, ethylbenzene, m- and p-xylenes, o-xylene
8) parameter is the sum of the following compounds: gasoline range organics, diesel range organics
9) parameter is the sum of the following 18 compounds included in SW846 8270C analysis:

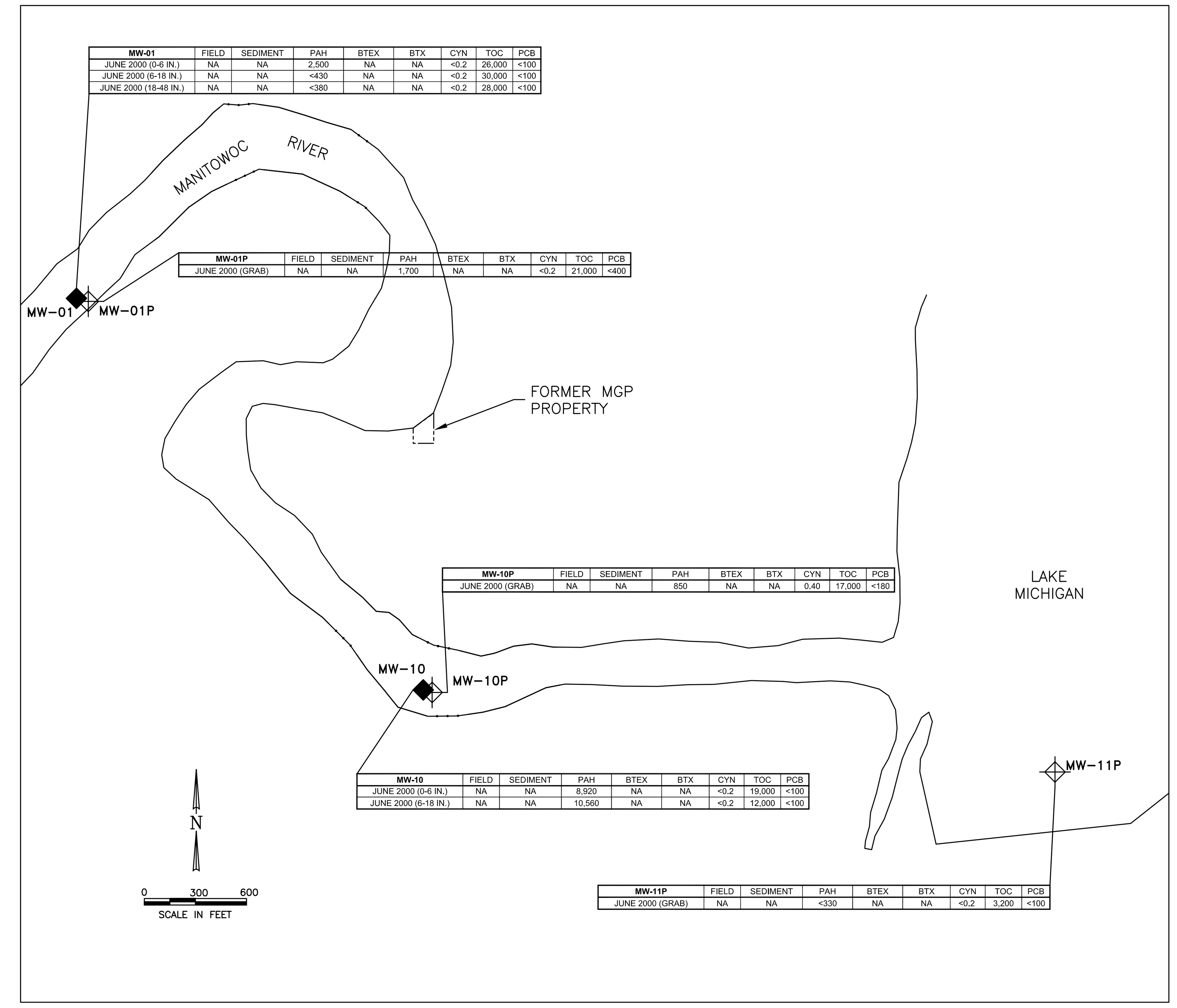
- Acenaphthene	- Dibenzo(a,h)anthracene
- Acenaphthylene	- Fluoranthene
- Anthracene	- Fluorene
- Benzo(a)anthracene	- 1-Methylnaphthalene
- Benzo(a)pyrene	- 2-Methylnaphthalene
- Benzo(b)fluoranthene	- Indeno(1,2,3-cd)pyrene
- Benzo(ghi)perylene	- Naphthalene
- Benzo(k)fluoranthene	- Phenanthrene
- Chrysene	- Pyrene

SHEETS



SAMPLE LOCATION	FIELD	SEDIMENT	PAH	BTEX	BTX	CYN	TOC	PCB
SAMPLE DATE (DEPTH)	FIELD OBSERVATIONS	SEDIMENT CHARACTERISTIC	TOTAL POLYNUCLEAR AROMATIC HYDROCARBONS	BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES	BENZENE, TOLUENE, AND XYLENES	TOTAL CYANIDE	TOTAL ORGANIC CARBON	TOTAL POLYCHLORINATED BIPHENYL
(FEET/INCHES BELOW TOP OF SEDIMENT)	T=TAR C=COAL FRAGMENTS S=SHEEN O=ODOR		(µg/kg)	(µg/kg)	(µg/kg)	(mg/kg)	(mg/kg)	(µg/kg)

<25 = ANALYTE WAS NOT DETECTED ABOVE THE LIMIT OF DETECTION (LOD) INDICATED
NA = NOT ANALYZED
µg/kg = MICROGRAMS PER KILOGRAM
mg/kg = MILLIGRAM PER KILOGRAM
N = SPIKED SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS
GRAB=PONAR SAMPLE
**= MATRIX INTERFERENCE



CBSQG	PAH (µg/kg)	BTEX[1] (µg/kg)	BTX (µg/kg)	CYN (mg/kg)	PCB (µg/kg)
TEC	1,610	NS	972	NS	60
MEC	12,205	NS	1,466	NS	368
PEC	22,800	NS	1,960	NS	676

CBSQG = Consensus-Based Sediment Quality Guidelines from WDNR (2003)
TEC = Threshold Effect Concentration
MEC = Midpoint Effect Concentration
PEC = Probable Effect Concentration
NS = no stadard established
Constituents that exceed the MEC are highlighted in yellow
Concentrations have not been normalized to 1% TOC
1. The CBSQG do not include concentrations for ethyl benzene

Reference:
The Wisconsin Department of Natural Resources. 2003.
Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application, Interim Guidance

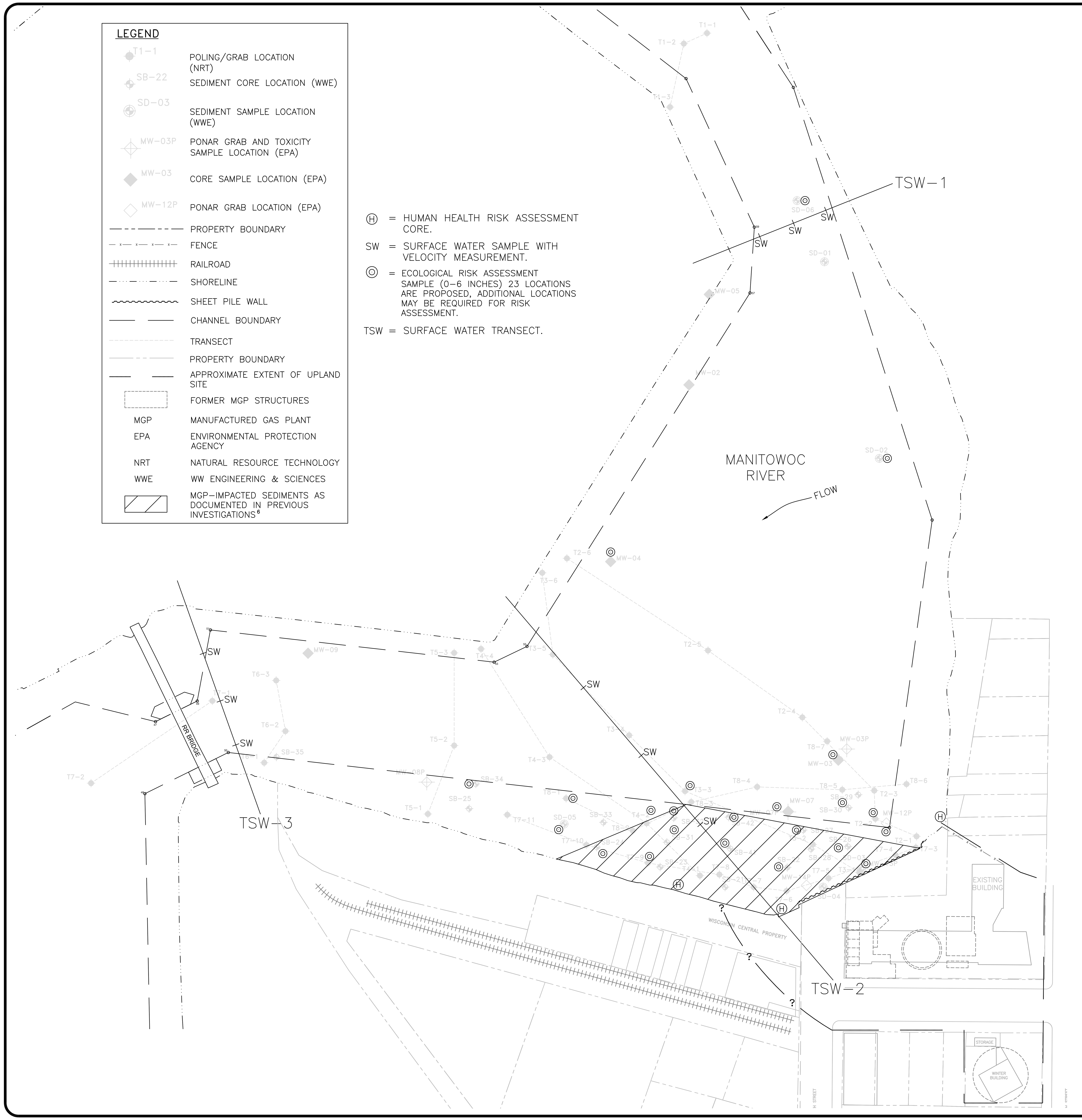
N

0 40 80 160
SCALE IN FEET

SOURCE NOTES:
1. THIS DRAWING WAS DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0110, DATED: APRIL 2001, AND FROM PART OF DRAWING SHEET 3 OF 4 TITLED "CONDITION OF CHANNEL – SEP. 1999", DATED SEPTEMBER 15, 1999. BY U.S. ARMY ENGINEERING DISTRICT, DETROIT. CORPS OF ENGINEERING, DETROIT, MICHIGAN.
2. EPA SAMPLES DETERMINED FROM A REPORT BY U.S. ENVIRONMENTAL PROTECTION AGENCY GREAT LAKES NATIONAL PROGRAM OFFICE, "JUNE 2000 SURVEY OF SEDIMENT CONTAMINATION ON THE MANITOWOC RIVER, MANITOWOC, WISCONSIN", SEPTEMBER 2002.
3. POLING LOCATIONS NRT FIELD MEASURED MAY 2003.
4. WELLS SURVEYED BY WPSC SEPTEMBER 2003.
5. ALL LOCATIONS ARE APPROXIMATE.

NATURAL RESOURCE TECHNOLOGY

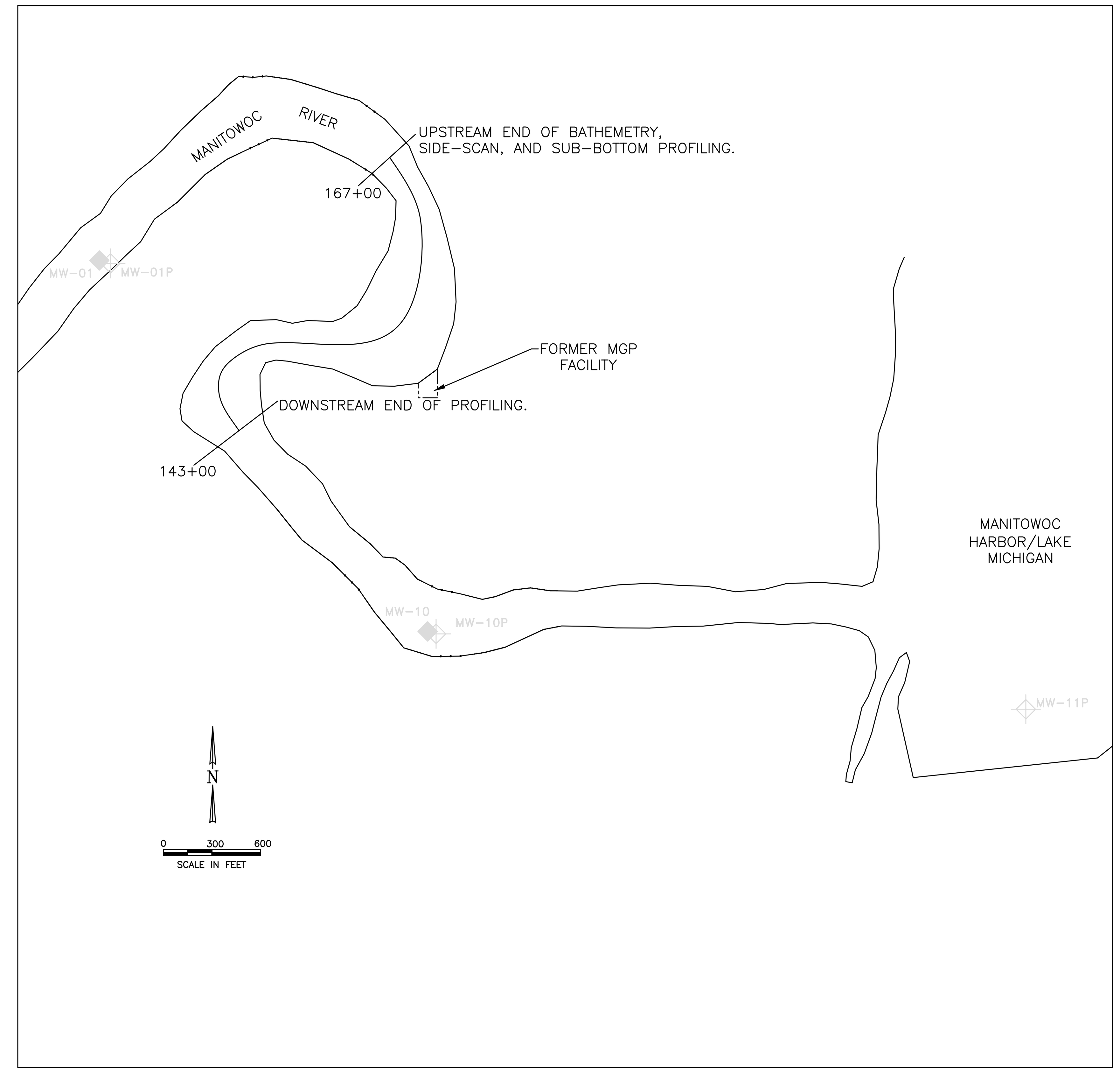
PROJECT NO. 1530/7.2	PREVIOUS SEDIMENT POLING POSITIONS AND SAMPLING LOCATIONS
DRAWN BY: BJK 04/02/08	SITE SPECIFIC WORK PLAN
CHECKED BY: JMK 04/02/08	FORMER MANITOWOC MGP SITE WISCONSIN PUBLIC SERVICE CORPORATION MANITOWOC, WISCONSIN
APPROVED BY: RHW 04/09/08	DRAWING NO: 1530-72-D01C-01 REFERENCE: 1530_Sed_analytical_summary Tables — SHEET NO. 1

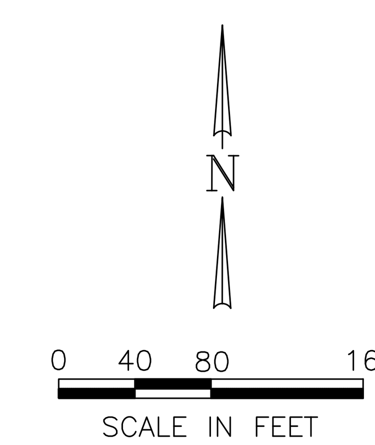


LEGEND

POLING/GRAB LOCATION (NRT)
SEDIMENT CORE LOCATION (WWE)
SEDIMENT SAMPLE LOCATION (WWE)
PONAR GRAB AND TOXICITY SAMPLE LOCATION (EPA)
CORE SAMPLE LOCATION (EPA)
PONAR GRAB LOCATION (EPA)
PROPERTY BOUNDARY
FENCE
RAILROAD
SHORELINE
SHEET PILE WALL
CHANNEL BOUNDARY
TRANSECT
PROPERTY BOUNDARY
APPROXIMATE EXTENT OF UPLAND SITE
FORMER MGP STRUCTURES
MGP MANUFACTURED GAS PLANT
EPA ENVIRONMENTAL PROTECTION AGENCY
NRT NATURAL RESOURCE TECHNOLOGY
WWE WW ENGINEERING & SCIENCES
MGP-IMPACTED SEDIMENTS AS DOCUMENTED IN PREVIOUS INVESTIGATIONS[6]

(H) = HUMAN HEALTH RISK ASSESSMENT CORE.
SW = SURFACE WATER SAMPLE WITH VELOCITY MEASUREMENT.
◎ = ECOLOGICAL RISK ASSESSMENT SAMPLE (0–6 INCHES) 23 LOCATIONS ARE PROPOSED, ADDITIONAL LOCATIONS MAY BE REQUIRED FOR RISK ASSESSMENT.
TSW = SURFACE WATER TRANSECT.





SOURCE NOTES:

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2. EPA SAMPLES DETERMINED FROM A REPORT BY U.S. ENVIRONMENTAL PROTECTION AGENCY GREAT LAKES NATIONAL PROGRAM OFFICE, "JUNE 2000 SURVEY OF SEDIMENT CONTAMINATION ON THE MANITOWOC RIVER, MANITOWOC, WISCONSIN", SEPTEMBER 2002.
3. POLING LOCATIONS NRT FIELD MEASURED MAY 2003.
4. WELLS SURVEYED BY WPSC SEPTEMBER 2003.
5. ALL LOCATIONS ARE APPROXIMATE.
6. AREA OF MGP IMPACTS WAS COMPILED FROM WWES 1991 AND NRT 2003.

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/7.2	STEP I PROPOSED SEDIMENT AND SURFACE WATER SAMPLING LOCATIONS
DRAWN BY: BJK 04/02/08	SITE SPECIFIC WORK PLAN FORMER MANITOWOC MGP SITE WISCONSIN PUBLIC SERVICE CORPORATION MANITOWOC, WISCONSIN
CHECKED BY: JMK 04/02/08	
APPROVED BY: RHW 04/09/08	DRAWING NO: 1530-72-D02C-01 REFERENCE: 1530_Sed_analytical_summary Tables

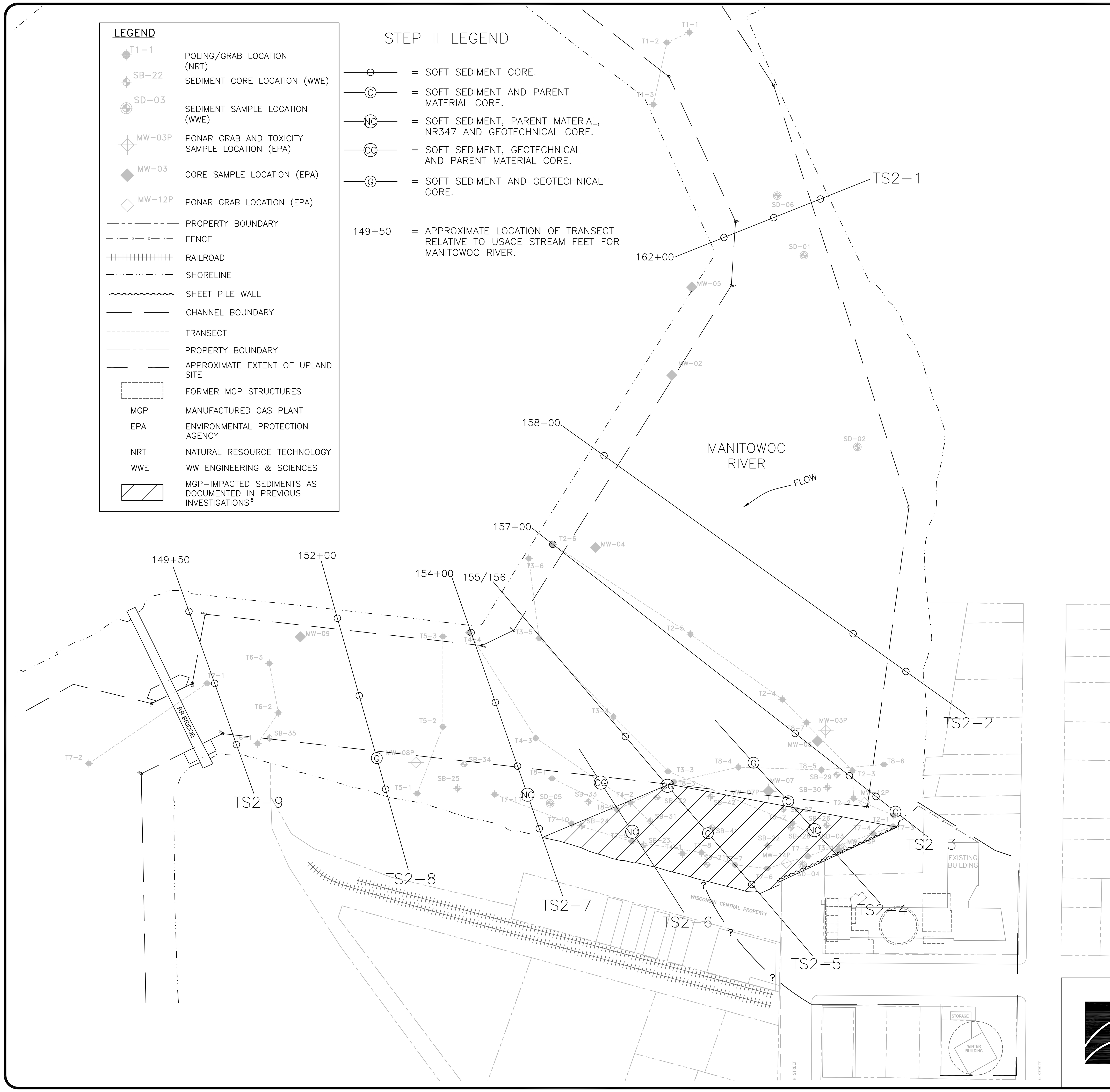
SHEET NO. 2

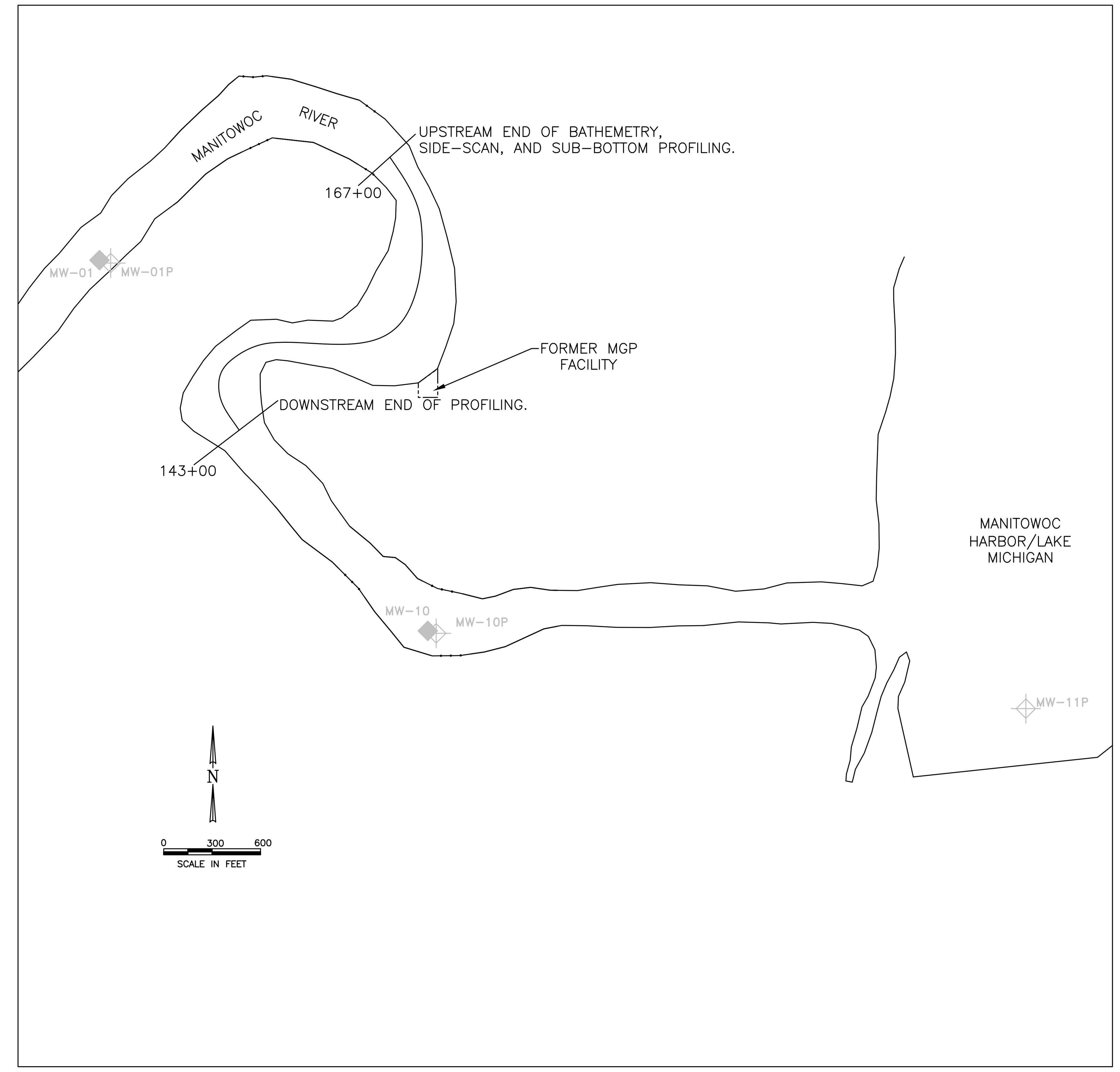
LEGEND

T1-1	POLING/GRAB LOCATION (NRT)
SB-22	SEDIMENT CORE LOCATION (WWE)
SD-03	SEDIMENT SAMPLE LOCATION (WWE)
MW-03P	PONAR GRAB AND TOXICITY SAMPLE LOCATION (EPA)
MW-03	CORE SAMPLE LOCATION (EPA)
MW-12P	PONAR GRAB LOCATION (EPA)
	PROPERTY BOUNDARY
	FENCE
	RAILROAD
	SHORELINE
	SHEET PILE WALL
	CHANNEL BOUNDARY
	TRANSECT
	PROPERTY BOUNDARY
	APPROXIMATE EXTENT OF UPLAND SITE
	FORMER MGP STRUCTURES
MGP	MANUFACTURED GAS PLANT
EPA	ENVIRONMENTAL PROTECTION AGENCY
NRT	NATURAL RESOURCE TECHNOLOGY
WWE	WW ENGINEERING & SCIENCES
	MGP-IMPACTED SEDIMENTS AS DOCUMENTED IN PREVIOUS INVESTIGATIONS[6]

STEP II LEGEND

	= SOFT SEDIMENT CORE.
C	= SOFT SEDIMENT AND PARENT MATERIAL CORE.
NC	= SOFT SEDIMENT, PARENT MATERIAL, NR347 AND GEOTECHNICAL CORE.
CG	= SOFT SEDIMENT, GEOTECHNICAL AND PARENT MATERIAL CORE.
G	= SOFT SEDIMENT AND GEOTECHNICAL CORE.
149+50	= APPROXIMATE LOCATION OF TRANSECT RELATIVE TO USACE STREAM FEET FOR MANITOWOC RIVER.





N

0 40 80 160

SCALE IN FEET

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3. POLING LOCATIONS NRT FIELD MEASURED MAY 2003.
4. WELLS SURVEYED BY WPSC SEPTEMBER 2003.
5. ALL LOCATIONS ARE APPROXIMATE.
6. AREA OF MGP IMPACTS WAS COMPILED FROM WWES 1991 AND NRT 2003.

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/7.2	**STEP II PROPOSED SEDIMENT AND SURFACE WATER SAMPLING LOCATIONS**
DRAWN BY: BJK 04/02/08	SITE SPECIFIC WORK PLAN FORMER MANITOWOC MGP SITE WISCONSIN PUBLIC SERVICE CORPORATION MANITOWOC, WISCONSIN
CHECKED BY: JMK 04/02/08	
APPROVED BY: RHW 04/09/08	DRAWING NO: 1530-72-D03-01 REFERENCE: 1530_Sed_analytical_summary Tables
SHEET NO.	3